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THE COST CURVE FOR STEEL PRODUCTION

KATHRYN H. WYLIE AND MORDECAI EZEKIEL
U.S. Department of Agriculture

THE relation between volume of output and cost of operation is vital for many questions of industrial and economic policy. A great deal of economic theory turns on the difference between increasing and decreasing costs.[1] Proposals for economic reform have been based on assumptions of decreasing cost per unit with increasing output and on ways by which the high efficiency at full operation might be reached.[2] Yet concrete measurements of the relation between output and cost, either for an industry as a whole or for major concerns in the industry, have been few or unsatisfactory. Studies of cost of production, either for purposes of wartime price-fixing[3] or for the administration of tariff acts,[4] have given at least a partial pic-

[1] E.g., see John D. Black and Albert G. Black, *Production Organization* (New York: Henry Holt & Co., 1929), pp. 133–37; John D. Black, *Introduction to Production Economics* (New York: Henry Holt & Co., 1926), p. 314.

[2] Cf. Mordecai Ezekiel, *$2500 a Year* (New York: Harcourt, Brace & Co., 1936) and *Jobs for All* (New York: Alfred A. Knopf, Inc., 1939); E. G. Nourse and Horace B. Drury, *Industrial Price Policies and Economic Progress* (Washington: Brookings Institution, 1938).

[3] Paul Willard Garrett, *Government Control over Prices*, "War Industries Board Price Bull. 3" (Washington: Government Printing Office, 1920), pp. 399–414.

[4] "Sugar," *U.S. Tariff Commission Report* (2d ser.; Washington: Government Printing Office [1934]), No. 73, pp. 198–215; "Copper," No. 29, p. 41; "Annual Report, 1929," pp. 17–23; John D. Black, H. R. Tolley, and Mordecai Ezekiel,

ture of the variation of average costs between different producers in an industry. Such studies, however, throw little light on the change in cost in a given concern with changes in the proportion of capacity operated.

The data published by the United States Steel Corporation, quarterly as well as annually, are fuller than those made available by most corporations and provide a basis for statistical investigation of the cost function. It has long been noted from these reports that differences in the percentage of capacity operated are closely correlated with changes in the profits of the concern.[5] But profits would also be affected by the price at which the product is sold, wage rates, prices of other cost items, and trends in technology. To find the true relation between differences in the rate of output, or the percentage of capacity operated, and profits or costs per unit, the effects of these other factors would all have to be eliminated. At the time this study was started no such attempt had been made, as far as the authors could determine. The results presented subsequently will indicate how far it was possible to isolate the cost curve for this dominant concern of the steel industry, using only data publicly available.

Before this study was ready for publication, however, the United States Steel Corporation made public a parallel study, based upon the unpublished data in the hands of the Corporation. This study, made for the Corporation by a staff under the general direction of Professor T. O. Yntema of the University of Chicago, was presented to the Temporary National Economic Committee as part of the material submitted by the Corporation.[6] Although certain criticisms can be made of the accounting

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Input as Related to Output in Farm Organization and Cost of Production Studies (Washington: Government Printing Office, 1924); and F. W. Peck, "The Cost of a Bushel of Wheat," *U.S. Department of Agriculture Yearbook* (Washington: Government Printing Office, 1920), pp. 301–8.

See vertical-file bibliographies, "Some Cost of Production Studies" (September 16, 1926), in Bureau of Agricultural Economics Library (typed manuscript); also Anne Martin Robertson, "The Cost of Agricultural Production in the United States" (typed manuscript; University of Wisconsin, June, 1921).

[5] D. W. Ellsworth, "The Business Outlook," *Annalist*, February 15, 1939.

[6] U.S. Steel Corporation, *An Analysis of Steel Prices, Volume, and Costs, Controlling Limitations on Price Reductions* (New York, 1940); also published by the

and statistical techniques used in making this study,[7] it stands as the most comprehensive and complete study of the steel cost curve, using all the data available in the records of the Corporation. Even with the more accurate data, however, the results secured by the Corporation were similar to those secured by our study. Our methods and results are presented now to illustrate a technique which may be useful for other industries and other concerns where the detailed internal data are not available.

The cost curve is not necessarily a fixed relation between volume and cost. Many factors other than volume influence it, as will be discussed subsequently. In addition, it may be influenced by the speed with which a change in production or in the other factors occurs. For example, it would undoubtedly be more costly to double production within one year than over five years. By taking into account the extent of the volume changes over each given interval, this time factor could be explicitly included in the statistical analysis. Since this was not done in the studies which follow, they reflect only the average volume-cost relation for the period considered, quarter to quarter or year to year. Hence, they do not necessarily give the volume-cost relation for unusually swift or unusually slow changes.[8]

INTRODUCTORY SURVEY

The United States Steel Corporation (hereafter called "the Corporation") is the largest single concern in the steel industry. The dominating influence of its leadership on the prices and price policy of the industry is generally recognized.[9] As a result of its price

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Temporary National Economic Committee in *Hearings before the Temporary National Economic Committee*, Part XXVI, Exhibit 1416 (now in press).

This and other studies and statistics submitted by the Corporation provide a wealth of new statistical and economic information, which will provide a rich source for subsequent studies in this field. Dr. Yntema and the Corporation deserve the thanks of economists and statisticians for the new material thus made available.

[7] See testimony by Louis H. Bean and Martin Taitel, Temporary National Economic Committee, *Proceedings* (January 25, 1940).

[8] For a new method of estimating the long-time supply curve for farm products see R. L. Mighell and R. H. Allen, "Supply Schedules—Long Time and Short Time," *Journal of Farm Economics*, XXII (August, 1940), pp. 544–57.

[9] Arthur R. Burns, *The Decline of Competition* (New York: McGraw-Hill Book Co., 1936), p. 77.

leadership, however, and of its cumbersome size, newer and smaller concerns have been able to cut into its business, so that its share of the total output of steel ingots and castings fell from 65 per cent in 1902 to 39 per cent in 1931, and 36 per cent in 1937. More recently, under a new president, the concern adopted more vigorous policies and may recapture some of its previous position.[10]

Despite the decline in its share of the total business, the Corporation remains the dominant concern, producing more than twice as much as the Bethlehem Steel Corporation—the next most important concern.

The Corporation operates, directly or through subsidiaries, ore and coal mines; steamships and railroads; blast-furnaces; rolling mills, both hand and continuous strip; tin-plate mills; cement plants; steel-fabricating plants for bridges and other heavy structures; and many other productive units. Its figures on capacity and output thus do not present a clear picture of a given plant more or less completely utilized but represent an average of operations in many different plants. At best, then, the over-all figures for the Corporation can yield only a hazy and approximate picture of the cost function for the operations of individual steel plants.

DATA AVAILABLE AND THEIR LIMITATIONS

The published data available for the analyses included the annual and quarterly statements of the Corporation and the general statistics on the steel industry, especially those on wages and

[10] *Ibid.*, p. 85, and Standard Statistics Corporation Records; 1937 figure is for steel-ingot production only.

PRODUCTION OF MAJOR STEEL CONCERNS, 1938

Concern	Ingot Capacity (Tons)	Percentage of Industry Total
U.S. Steel Corporation	25,790,000	36.8
Bethlehem Steel Corporation	10,042,000	14.9
Republic Steel Company	6,500,000	9.3
Jones and Laughlin Steel	3,671,000	5.2
National Steel Corporation	3,400,000	4.9
Youngstown Sheet and Tube Company	3,120,000	4.5
Inland Steel Company	2,800,000	4.0
American Rolling Mill Company	2,550,000	3.6
Total		83.2

prices. The latter are based on quoted prices and are partly nominal.[11] These data cover production, percentage of capacity operated, profits both before and after depreciation, wage rates, and prices. The specific data used in the investigation are shown in detail subsequently.

The statistical significance of the series available is reduced by two factors: (1) the high degree of serial correlation between successive observations and (2) the high intercorrelation among many of the variables treated as independent variables. The possible effects of the serial correlations were reduced by analyzing annual series as well as quarterly series, so as to prevent the serial correlation from exaggerating the true correlation. The high intercorrelation among the independent variables and other difficulties cut down the reliability of the results secured. This is called to the attention of the reader here in order that he may read the entire paper with these limitations in mind.

ANALYSES PRESENTED

Two quarterly analyses are presented in this paper—one covering the period 1929 through 1937 and one 1932 through 1937. In addition, three analyses were run on an annual basis. Only the two most successful of these three are presented here. The analysis discarded included a factor for the quality of product which seemed to be of doubtful reliability and which gave no significant correlation with cost.

After testing many different ways of relating the estimated costs of production per ton to capacity and wages, it was found that the best explanation could be obtained by breaking cost into two separate components: (1) the total charge for depreciation and depletion and (2) the costs other than depreciation and depletion. The two components were analyzed separately for both the quarterly and annual data.

CONCEPTS OF DIRECT COST

Since direct costs were not reported separately by the Corporation (prior to the recent Temporary National Economic Com-

[11] The data subsequently presented by the Corporation to the T.N.E.C. show that the actual mill-net yield may at times vary as much as 7 per cent from the reported prices.

mittee testimony), it was necessary to derive a cost figure from the data as reported.

A preliminary analysis of the quarterly data showed that the regression of profits on prices (composite of iron and steel) with other factors held constant, was practically 1 to 1, indicating that changes in the composite price were a fairly good indicator of changes in the per ton price received by the Corporation. In view of this fact, the figures on composite price, production, and profits were used to estimate the cost of production other than depreciation and depletion. This was done by calculating the net profit per ton before depreciation and subtracting that profit from the composite price of iron and steel per ton. That is, since

$$\text{(price)} - \text{(cost)} = \text{profit per ton},$$

$$\text{(price)} - \text{(profit)} = \text{cost per ton}.$$

In the case of the annual data, it was felt desirable to check the method of estimating cost used in the quarterly data by holding more closely to the Corporation reports and by using the reported revenue of the Corporation for each year, together with profits reported, as a basis for estimating the average income received per ton of product sold. The direct costs were computed by subtracting profits available for dividends, bond interest, taxes, and depreciation and depletion charges from the total revenue of the Corporation, excluding intercompany sales. The resulting figure divided by the tonnage of finished steel produced was used as the estimated direct cost per ton. While the sales figures for the Corporation's varied products are reported for certain years, it was impossible to separate out the profit and cost items for the different products. Since finished steel is the largest item in the sales of the company, the direct cost was divided by the production of finished steel to secure a unit cost figure.[13]

[13] The average receipts of the Corporation per ton of sales run considerably higher year by year than does the reported composite price per ton of iron and steel. Accordingly, when costs are computed by subtracting profits from the composite price per ton (as done in the quarterly study), the results are quite different than when costs are computed by subtracting profits from the average revenue per ton sold (as done with the annual data). In the latter case a given change in profits per ton has relatively less influence on costs per ton than in the former case. Accord-

For one of the annual analyses, the cost per ton derived from the revenue figures was split into labor costs and other costs, and the factors affecting each analyzed separately.

CHARGES FOR DEPRECIATION AND DEPLETION AS A FUNCTION OF PRODUCTION

According to the annual reports of the Corporation, its charges for depreciation and depletion are made by a straight-line method (except for railroad property) by applying against investment cost of each facility a rate of depreciation based on life-expectancy of that facility at its average operating use. In arriving at the annual charge for depreciation, the procedure is modified when the actual operating use of the facility is less than the predetermined average use, but the charge is never less than 50 per cent of the full rate of depreciation, even if such facility is not operated during the year. The plan involves a revision of rates when a change in life-expectancy becomes apparent. The charge for depreciation on railroad property owned is by a straight-line method approved by the Interstate Commerce Commission. The depletion rate per ton or unit mined of raw materials is the pro rata investment cost, arrived at by dividing the total estimated recoverable quantity in the respective properties in operation into the total investment cost.

QUARTERLY ANALYSIS

The aggregate quarterly charges for depreciation and depletion are closely related to the quarterly sales (Fig. 1). There were occasional quarters, as, for example, the fourth quarter of 1929 and 1930 and the second, third, and fourth quarters of 1931, when the charge for depreciation and depletion was reduced to far below what it ordinarily would be with the prevailing rate of sales. With the exception of these quarters, however, there was a very close relation between output and the total charge. The average relation[13] between sales and depreciation is shown by the

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ingly, the slopes of the cost curves, as based on analyses derived from these two processes, are not precisely comparable. The effect of this difference on the final cost curves will be considered subsequently.

[13] This regression was fitted by eye, disregarding the five observations with abnormally low charges. As the data on Figure 1 indicate, there was some tendency

regression line on Figure 1 and is stated in the following equation:

$$X_1 = \$7{,}850{,}000 + \$2.08Y\,, \qquad (1)$$

where X_1 is the total charge for depreciation and depletion in dollars and Y represents the quarterly sales, stated in tons.

With the exception of the five quarters mentioned, this equation estimates the quarterly charges for depreciation and deple-

U. S. STEEL CORPORATION: RELATION OF CHARGES FOR DEPRECIATION AND DEPLETION TO SALES, QUARTERLY, 1929-39

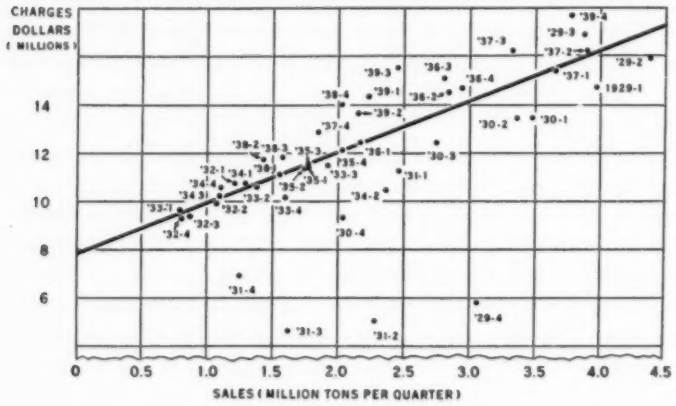

FIG. 1

tion to within two million dollars in every one of the quarters on which the analysis was based and within one million dollars of the charges actually made in the great proportion of them. When the equation was extrapolated to 1939, the largest error was two and one-half millions.

ANNUAL ANALYSIS

Charges for depreciation and depletion as reported by the Corporation in its annual statements were used in the annual analy-

to upward trend in depreciation charges, particularly marked in 1938 and 1939. At the time the study was completed, however, the data were available only through the second quarter of 1938, and the data through the rest of 1938 and 1939 show a trend even more marked than earlier. As the adjustment for trend was small compared to changes in the volume of sales, trend was not used in this stage of the analysis.

sis. Annual depreciation charges were correlated with production of finished steel. The years 1920–34 only were used to determine the relation, and the years 1935–39 were used to test the reliability of the regression.

The annual data showed much the same relations as did the quarterly data. An upward trend was fitted from 1920 through 1927, flattening out thereafter (Figs. 2 and 3). The estimates after

U. S. STEEL CORPORATION: RELATION OF CHARGES FOR DEPRECIATION AND DEPLETION TO SALES, ANNUAL DATA, 1920-39

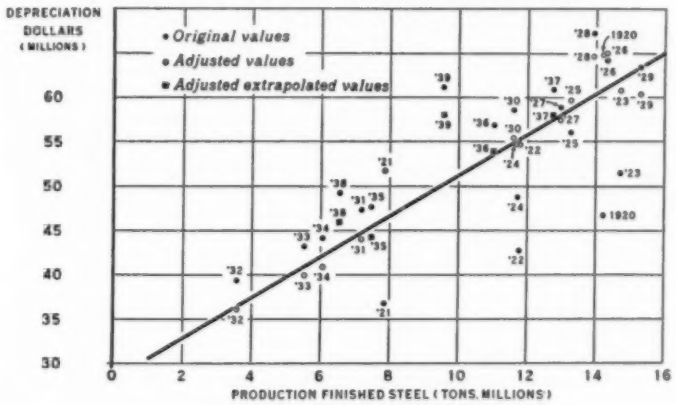

FIG. 2.—1935 through 1939 are extrapolated values

1934 were made by extrapolating the flat trend. (When the data for 1938 and 1939 became available, however, it appeared to follow a new upward trend in depreciation costs.) The annual relation between depreciation and production is shown by the regression line[14]

$$X_1 = \$28{,}750{,}000 + \$2.25\,(X_2) + f(T)\,, \qquad (2)$$

where X_1 is the total depreciation in dollars, X_2 is production of finished steel in tons, and $f(T)$ is the trend shown on Figure 3.

[14] The comparable equation as determined in the U.S. Steel study (without a trend factor) from data for 1927–38 was

$$X_1 = \$29{,}500{,}000 + \$2.37X_2\,.$$

The values in equation (2) were determined by the graphic approximation method.

The annual analysis gives a normal charge per ton for depreciation and depletion somewhat higher for each level of capacity operation than the quarterly analysis. The differences are not great, however; they range from 19 cents per ton at 80 per cent capacity to 26 cents per ton at 20 per cent capacity.

The annual analysis, based on the years 1920–34, when extrapolated for the years 1935–39, gives estimates of depreciation no more in error, on the average, than during the earlier years.

TREND IN DEPRECIATION AND DEPLETION CHARGES, 1920-39

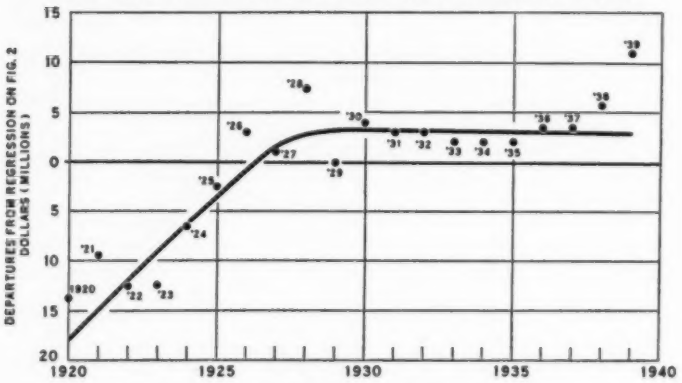

FIG. 3.—1935 through 1939 are extrapolated values

CHARGES FOR OTHER COSTS AS A FUNCTION OF OUTPUT WAGE RATES, AND OTHER FACTORS

The monthly, quarterly, and annual reports of the Corporation show wide changes in the volume of sales and in the net profits.[15] There is a close association between the volume of sales and the amount of profits (Fig. 4).

The profits of a steel concern, and the costs as well, are obviously affected by many other factors besides the volume of sales. These might include:

1. The price received (at the factory) for given types of steel
2. Shifts in the kind of steel sold, as between more profitable and less profitable lines
3. Changes in prices of coal, ore, machinery, and other materials purchased

[15] The quarterly data are tabulated in Tables A and B in the appendix.

4. Changes in wages of labor per hour
5. Changes in efficiency of production, with respect to (*a*) labor, and (*b*) other cost factors

Of these possible influences, published data for the steel industry were available as follows:

1. The average prices of various products, together with composite prices for various groups of products, as reported from various sources
2. The index of numbers of men employed in the iron and steel industry and, beginning in 1932, the average hours worked per week per man employed, reported by the Bureau of Labor Statistics; hours worked per week in the U.S. Steel Corporation available since 1933, annually; hours worked in the steel industry reported by the National Industrial Conference Board since 1920
3. Index of pay rolls
4. Index of production
5. Average hourly rates paid in the steel industry reported by the Bureau of Labor Statistics since 1932; for the U.S. Steel Corporation, annually since 1933; National Industrial Conference Board figures since 1920.

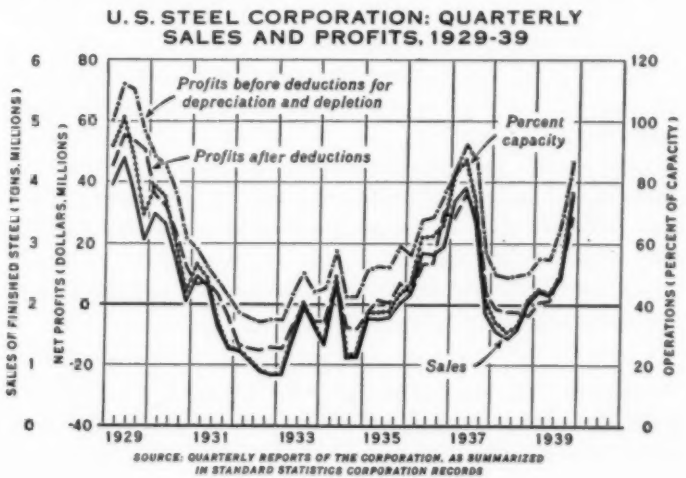

FIG. 4

These data, together with those published by the Corporation itself, provide a basis for an analysis of the Corporation's costs in relation to volume of output in percentage of capacity, steel prices, and average hourly earnings.

The direct costs of production per ton should reasonably be related (*a*) to the wage costs per hour, (*b*) to secular changes in efficiency in the use of labor, (*c*) to changes, if any, in the labor required per ton of steel as output varies, and (*d*) to changes in the costs of fuel, ore, lime, etc., per ton of steel. To the extent that these latter items are not purchased but are produced by the concern itself, their costs also would largely break down into labor, overhead, and depletion costs.

QUARTERLY ANALYSIS

The variables for the quarterly analysis may be designated as follows: X_1 = production costs, excluding depreciation and depletion, in dollars per ton shipped; X_2 = charges for depreciation and depletion, in thousand dollars; X_3 = capacity of the U.S. Steel Corporation, in thousand tons; X_4 = percentage of capacity operated, in percentage points; X_5 = average hourly earnings, in cents. These data are listed in Table C in the appendix.

The estimated cost of production per ton (X_1) was found to be related to both X_4 and X_5. In addition, a quarterly adjustment was included to take account of the fact that the relation of costs to percentage capacity and average hourly earnings varied slightly from quarter to quarter.

The relations were studied for two periods—the entire period 1929–38 and the more recent period 1932–38. Data for the former period included wage costs per hour estimated from the indices of production and employment, which were not as accurate as the average hourly earnings in the steel industry reported by the Bureau of Labor Statistics for the later period.[16]

FORM OF EQUATION ASSUMED

Studies by the Bureau of Labor Statistics[17] have shown that the hours of labor required per ton of steel decline as the percentage of capacity operated increases. Accordingly, the effect of wage

[16] At the time this study was made no data were published by the Corporation showing the hourly earnings actually paid by it prior to 1933, and after 1933 the data were given only in annual figures. Accordingly, data for the industry as a whole were used.

[17] "Man-Hours of Labor per Unit of Output in Steel Manufacture," *Monthly Labor Review*, XL (1935), p. 1155. These studies did not cover as wide a range of use of capacity as the data from the Corporation. After a certain percentage capacity

rates on steel costs per ton should not be a constant one but one which changes with the percentage capacity operated. This may be stated in the general equation

$$X_1 = f_{4,5}(X_4, X_5),$$

that is, cost is a joint function of X_4 and X_5 taken together.[18] A joint correlation surface for X_4 and X_5 was fitted to the data, and tests were made to see if any measurable evidence of a trend could be found. No significant trend was found. Apparently, changes in the efficiency in the use of labor in the United States Steel Corporation as a whole, during the period covered, were not large enough to show up in the data used, when all costs except depreciation were lumped together.

The joint relation found for the surface

$$X_1 = f_{4,5}(X_4, X_5)$$

was of such a nature as to indicate that changes in average hourly earnings modify, in a percentage manner, the costs that might otherwise prevail. That is, the same change in average hourly earnings that would produce a large increase in costs per ton when costs were high because of low-capacity operation would produce a smaller increase in costs per ton when costs were lower because of higher operations. To check the joint functional analysis more closely, this relation was expressed as

$$\log X_1 = f_4(X_4) + b(X_5).$$

It was found that a straight-line regression, indicated by the b, gave a satisfactory fit to average hourly earnings, when percentage capacity was thus simultaneously taken into account.

A second check for secular trend at this point revealed no significant long-time change in cost per ton, relative to average

is reached, it is possible that the hours of labor per ton of steel might again increase as higher capacity was utilized because of bringing obsolete equipment back into use or because of other inefficiencies of high-capacity output. No such relations were found in this study, however, within the range of the use of capacity covered.

[18] For a discussion of joint functions and methods of analyzing them see Mordecai Ezekiel, *Methods of Correlation Analysis* (New York: John Wiley & Sons, Inc., 1930), pp. 277–99 and 308–15.

hourly earnings and percentage capacity. Apparently, the introduction of continuous-strip mills and other new processes did not go far enough in the Corporation during the period 1929–38 to make any measurable difference in the relations studied, within the limits of accuracy of the quarterly data available for this investigation.

A simultaneous seasonal factor was introduced to account for the fact that the relations between the two factors and cost varied somewhat from quarter to quarter, possibly because of accounting practices of entering charges at different times of the year.

As a result of these preliminary studies the final equation used for analyzing the quarterly costs per ton was

$$\log X_1 = f_{14.5s}(X_4) + b_{15.4s}X_5 + \text{seasonal adjustment}, \qquad (3)$$

where X_1, X_4, and X_5 represent the cost per ton, percentage capacity operated, and average hourly earnings, as shown in Table C in the appendix.

The closeness of the relationship was as shown in Table 1.

Two limiting assumptions were made in fitting the regression curves. The first was that the relation between capacity and cost, $f_{14.5s}(X_4)$, would have only a single minimum, that is, the cost per ton might fall with increased output to some point and then rise thereafter. (Actually, the data showed no indication of a tendency for cost per unit to rise with high output, within the limits of the data available for analysis.) The second assumption, with respect to labor, was that the change would be proportional—that is, an increase in wages from 50 to 60 cents per hour would be expected to increase costs per ton by as much as would an increase from 60 to 70 cents per hour. It might have been better to have expressed this relation by the use of the equation

$$\log X_1 = f_{14.5s}(X_4) + b_{15.4s}(\log X_5) + s,$$

where the component $b_{15.4s}(\log X_5)$ would have assumed a constant percentage change in total cost for each given percentage change in wages. The differences between that formulation and the one used would, however, have been slight. In any case the reliability of the regressions on wages is so low that either formulation

would have given substantially the same results. The data supported the assumption of linearity very well.

These correlations are sufficiently high, with the number of observations available, to indicate the presence of a significant relation. For the longer period, for example, the correlation of 0.94, with thirty-eight cases and seven degrees of freedom used up in the analysis, indicates that the odds are nineteen out of twenty that the true correlation is at least 0.87.[19] The standard error of estimate, for both analyses, indicates that estimates of the cost per ton come within 7 per cent of the actual cost two out of three times, on the average.

TABLE 1

Period	Observations	Correlation r	Standard Error of Estimate* s
1929–38.....	38	0.94	6.9 to −6.4 per cent
1932–38.....	26	0.85	7.2 to −6.7

* The slight differences in the percentage range are due to converting the errors in terms of ± a given logarithm back to equivalent percentages.

RELIABILITY OF THE CORRELATION RESULTS

The changes in cost per ton corresponding to given changes in percentage of capacity operated are shown in Table 2 for both analyses. This table also gives the standard error of these regressions.[20] It appears from these error computations that the measurements of changes in cost with changes in capacity operated are quite reliable between 20 per cent and 70 per cent of capacity but are less reliable above 70 per cent. The change in cost with changes in average hourly earnings is less accurately measured. There is one chance out of three that the true change in cost with changes in average hourly earnings may be only half as great as that found or may be twice as large. When it is remembered

[19] From *ibid.*, chart on p. 396.

[20] For method of computing these standard errors see *ibid.*, pp. 254–55, 384–89. The application of these error formulas to these data assumes that the conditions of simple sampling apply. To the extent that changing conditions exist in this industry, the errors may be larger than indicated by these formulas. Serial correlations among the data may also make the reliability less than indicated by these tests.

TABLE 2

REGRESSIONS AND THEIR STANDARD ERRORS FROM QUARTERLY ANALYSIS

A. Period 1929–38: Regression of Cost on Capacity Operated

Percentage Capacity Operated	Corresponding Cost per Ton	Difference in Cost from That at Mean Rate*	Standard Error†
20	33.20	+10.40	±0.86
30	27.50	+ 4.70	±0.69
40	24.40	+ 1.60	±0.33
50	22.50	− 0.30	±0.19
60	21.45	− 1.35	±0.55
70	20.80	− 2.00	±0.73
80	20.35	− 2.45	±0.85
90	20.10	− 2.70	±0.96
100	19.95	− 2.85	±1.94

B. Period 1929–38: Regression of Cost on Wage Rate per Hour

Wage Rate (Cents)	Cost in Percentage of That Expected from Capacity Regression	Difference in Cost from That at Mean Rate‡ (In Percentage Points)	Standard Error
55	100.0	−2.9	±3.6
65	102.1	−0.8	±1.6
75	103.9	+1.0	±1.8
85	105.9	+3.0	±3.9

* The mean rate for the period was 48 per cent with a cost of $22.80.

† The figure following the ± sign is the standard error of the difference in cost from the cost at mean rate of operation.

‡ The mean wage rate for the period was 69.3 cents, with a mean cost of 102.9 per cent.

BB. Seasonal Correction for Period 1929–38

Quarter	Cost in Percentage of that Otherwise Expected
1st	103.2
2d	100.8
3d	99.2
4th	96.8

TABLE 2—*Continued*

C. Period 1932–38: Regression of Cost on Capacity Operated

Percentage Capacity Operated	Corresponding Cost per Ton	Difference in Cost from That at Mean Rate§	Standard Error
17	38.50	+12.70	±1.14
25	30.74	+ 4.94	±0.57
35	26.99	+ 1.19	±0.47
45	25.08	− 0.72	±0.30
55	24.06	− 1.74	±0.82
65	23.62	− 2.18	±0.87
75	23.52	− 2.28	±1.83
85	23.42	− 2.38	±1.50

D. Period 1932–38: Regression of Cost on Wage Rate per Hour

Wage Rate (Cents)	Cost in Percentage of That Expected from Capacity Regression	Difference in Cost from That at Mean Rate‖ (In Percentage Points)	Standard Error
45	92.6	−7.1	±4.8
55	95.9	−3.8	±4.3
65	99.5	−0.2	±1.2
75	103.0	+3.3	±7.4
85	106.9	+7.2	±3.2

§ The mean rate for the period was 40.5 per cent with a cost of $25.80.

‖ The mean wage rate for the period was 65.3 cents, with a mean cost of 99.7 per cent.

DD. Seasonal Correction for Period 1932–38

Quarter	Seasonal Correction Cost in Percentage of Estimated
1st	101.2
2d	99.4
3d	98.9
4th	100.4

that the average hourly earnings used here are not those paid by the Corporation, but those for the industry as a whole, it is not surprising that their relation to the Corporation's production cost should be so vague.

The errors are definitely smaller for the regressions determined from the whole period, 1929–38, than for those from the shorter period, 1932–38. The standard errors of estimate are about the

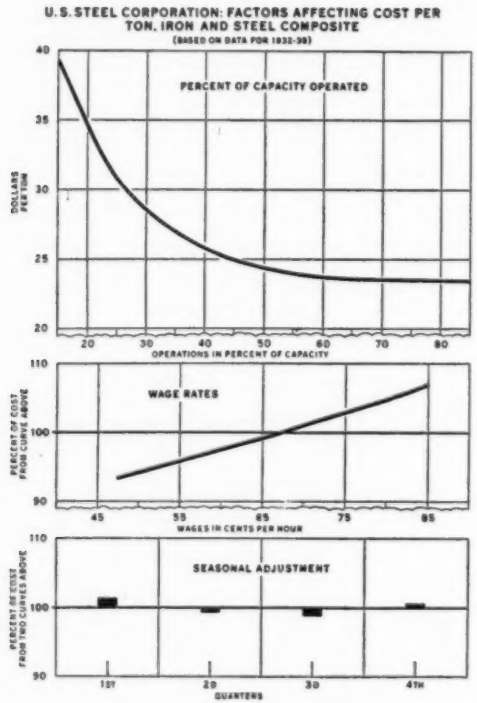

FIG. 5.—Regressions based on quarterly data for 1932, first quarter, through 1938, second quarter.

same for both analyses, however. Since the wage rates for the earlier period, 1929–31, are only rough approximations based on over-all index numbers, it was believed better to use the results for the shorter period, even though they show a lower multiple correlation and somewhat larger errors for the regressions.

The regressions for the shorter period, together with the seasonal adjustment, are shown in Figure 5.

ESTIMATING PRODUCTION COST FOR A GIVEN LEVEL OF PRODUCTION, PRICES, AND WAGES

The way these results may be used in estimating costs may be illustrated by a concrete example. In the fourth quarter of 1937 the Corporation operated at 41.4 per cent of capacity, selling 1,869,000 tons of steel, and the industry paid wages averaging 83.1 cents per hour. What would the costs be per ton?

Direct costs (in terms of the composite price of iron and steel) may be estimated from the data given in Figure 5. At 41.4 per

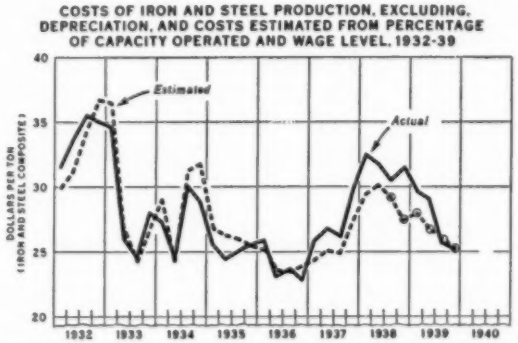

FIG. 6.—Extrapolated values 1938, third quarter, through 1939, fourth quarter

cent of capacity, the cost from the upper grid (with average wage rates) would be $25.60. Wage rates at 83.1 cents require an addition of 6.1 per cent to this cost, from the central grid of Figure 5 or by interpolation in Table 1. The seasonal correction for the fourth quarter is 1.004. The estimated cost, excluding depreciation and depletion, then is

$$\$25.60 \times 1.061 \times 1.004 = \$27.27 .$$

This compares with an actual cost of $29.79 for that quarter.

When the cost for each period is estimated in this way, estimated costs are obtained as shown in Figure 6. In this figure the estimated costs per ton are shown by the dotted line, and the actual costs by the solid line. The degree of consistency of the two lines indicates the extent to which the analysis accounts for the changes in cost during the period shown.

The data for the last two quarters of 1938 and for 1939 were not available when this investigation was started and therefore were not included in the analysis. The estimated costs for the third and fourth quarters of 1938 and those for 1939 shown in Figure 6 represent an extrapolation of the formulas based on the earlier periods. The errors here are of about the same magnitude as those found earlier for the third quarter of 1938 and for 1939 but are much larger for the fourth quarter of 1938.

The charges for depreciation for any quarter may also be estimated by the use of Figure 1 or of equation (1). For the last quarter of 1937, with sales of 1,869,000 tons, equation (1) gives an expected depreciation charge of $11,738,000. Adding to this the estimated direct costs for 1,869,000 tons at $27.27 per ton and dividing by the number of tons gives $33.55 as the total cost per ton sold during the quarter, including depreciation and depletion charges.

ESTIMATING NET PROFIT FOR A GIVEN LEVEL OF PRODUCTION, PRICES, AND WAGES

The net profit for a quarter may be estimated by a continuation of this same process. This is illustrated, for the fourth quarter of 1937, as follows.

In that quarter 1,869,000 tons were sold; the composite price of iron and steel was $39.15 per ton; the percentage of capacity represented by sales was 41.4; and the wage rate for the industry was 83.1 cents per hour.

The computation of estimated net profit is given in Table 3.

TABLE 3

Estimated income (1,869,000 tons at $39.15)		$73,171,000
Estimated costs (direct costs, 1,869,000 tons at $27.27)	$50,967,630	
Depreciation and depletion by formula	11,738,000	
Total costs		62,705,630
Estimated net profit after depreciation and depletion		$10,465,370

This estimated net profit compares with a reported net of $4,581,000 for the same quarter.

When the net profit for each quarter is computed by this same method and compared with the actual profits by quarters, results are secured as shown in Table 4. The data in the table are charted in Figure 7.

During the period covered, quarterly net profits after depreciation varied from a fifteen-million deficit to a thirty-six million profit. With this much variation in profit, the estimated profits fell within two million dollars of the actual profit more than two-thirds of the time.

It is possible that a closer forecast of profit alone could be made by correlating profits directly with sales, prices, and wages. The object of this study, however, was not primarily to estimate profits but rather to determine the underlying relations between costs and wages and percentage of capacity operated. The fact that this analysis also gives fairly good estimates of profits is presented merely as an over-all check on the earlier analyses.

ANALYSIS OF DIRECT COST, ANNUAL DATA

The quarterly analysis estimated cost per ton by subtracting profit per ton from the quoted composite price for iron and steel. To the extent that the average products of the Corporation are of higher quality than those represented in this composite price, this calculation understates the price and thereby produces a calculated cost per ton which is below the actual costs of the Corporation for its average products.[21] For the annual analyses the Corporation's reports of total revenue were used for estimating the average price actually received per ton of steel products sold. Some error was involved in this process, through including some income from sales of nonsteel products, such as cement, and through ignoring changes in the composition of the steel sold.[22] From these total revenues, depletion and depreciation were first subtracted. The balance, direct cost, was analyzed in two differ-

[21] The effect of this error upon the cost curve is considered subsequently.

[22] The published data were not sufficient to adjust the quantities sold or the revenue received to eliminate changes in the proportion of different steel products sold. The subsequent analysis published by the Corporation (*op. cit.*) did use a "weighted tonnage of all tonnage products shipped" which was adjusted to correct for changes in the composition of sales.

TABLE 4

PROFITS AFTER DEDUCTION FOR DEPRECIATION AND DEPLETION

Quarter	Actual Profits (Million Dollars)	Estimated Profits (Million Dollars)	Error (Million Dollars)
1932 total	− 57.2	− 53.6	.....
1st quarter	− 13.2	− 11.0	− 2.2
2d quarter	− 14.6	− 12.0	− 2.6
3d quarter	− 15.1	− 14.5	− 0.6
4th quarter	− 14.4	− 16.1	+ 1.7
1933 total	− 29.0	− 16.1	.....
1st quarter	− 14.7	− 16.5	+ 1.8
2d quarter	− 7.0	− 8.7	+ 1.7
3d quarter	− 0.9	− 0.8	− 0.07
4th quarter	− 5.9	− 5.1	− 0.8
1934 total	− 13.8	− 18.7	.....
1st quarter	− 5.5	− 7.6	+ 2.1
2d quarter	+ 7.3	+ 7.7	− 0.4
3d quarter	− 7.7	− 9.1	+ 1.4
4th quarter	− 8.0	− 9.7	+ 1.6
1935 total	+ 8.9	+ 2.1	.....
1st quarter	− 0.2	− 1.3	+ 1.06
2d quarter	+ 1.5	− 0.7	+ 2.2
3d quarter	+ 0.6	+ 0.5	+ 0.1
4th quarter	+ 7.1	+ 3.6	+ 3.5
1936 total	+ 52.1	+ 52.7	.....
1st quarter	+ 4.0	+ 5.6	− 1.6
2d quarter	+ 13.4	+ 13.0	+ 0.4
3d quarter	+ 13.8	+ 15.7	− 1.9
4th quarter	+ 20.7	+ 18.4	+ 2.3
1937 total	+100.0	+123.9	.....
1st quarter	+ 28.6	+ 34.1	− 5.5
2d quarter	+ 36.2	+ 42.9	− 6.7
3d quarter	+ 30.6	+ 36.4	− 5.8
4th quarter	+ 4.6	+ 10.5	− 5.9
1938 total	− 10.1	+ 10.8	.....
1st quarter	− 1.3	+ 3.8	− 5.1
2d quarter	− 2.6	+ 0.2	− 2.8
3d quarter	− 2.4	+ 0.4	− 2.8
4th quarter	− 3.8	+ 6.4	−10.2
1939 total	+ 41.2	+ 56.5	.....
1st quarter	+ 0.7	+ 6.2	− 5.5
2d quarter	+ 1.3	+ 7.5	− 6.2
3d quarter	+ 10.4	+ 12.2	− 1.8
4th quarter	+ 28.8	+ 30.6	− 1.8

ent ways. The first took the direct cost per ton as the dependent factor, the second separated labor costs from other direct costs and analyzed each of them separately.

TOTAL COST

The dependent factor—cost per ton of finished steel produced—was derived from the Corporation's reports of total revenue (excluding intercompany sales). From this figure for each year was subtracted the reported profits, bond interest, taxes, and depreciation and depletion. The remainder was divided by the number of

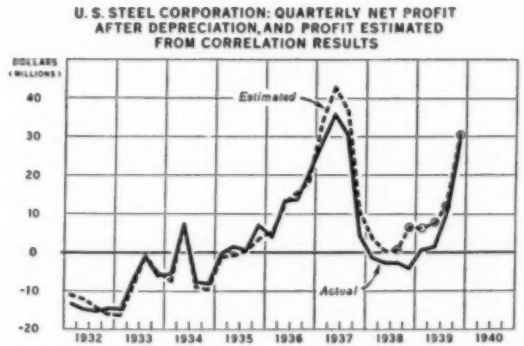

FIG. 7.—Extrapolated values 1938, third quarter, through 1939, fourth quarter

tons of finished steel produced to secure a unit cost figure. The first independent variable used was percentage of capacity operated, as reported by the Corporation on January 1 of each year. The price of steel scrap and the average hourly earnings were the other independent variables. The Corporation reports provided annual data on average hourly earnings from 1933 to date. For the years prior to that time the figure was estimated from the average hourly earnings in the steel industry as reported by the National Industrial Conference Board, according to the relation of the latter figure since 1933 to the hourly earnings reported by the Corporation.

The Corporation owns most of its own ore and fuel mines, transportation lines, etc., and the cost of these items should break down into labor and depreciation and depletion costs. The big

steel companies buy about half of the steel scrap which they use in steel manufacture. Even though this purchase of scrap might represent only a small proportion of the cost of raw materials, the price of scrap was used in an attempt to take changes in material costs into account in explaining steel costs.[23] A measure of changes in the efficiency of labor other than that associated with differences in the percentage capacity operated was used as an additional independent factor.[24] Only the years 1920–34 were used in the analysis, with 1935–39 left free to test the reliability of the relations determined.

FORM OF EQUATION USED

Making the same assumptions as in the analysis of the quarterly data, this analysis of the annual data used the regression equation

$$\left.\begin{aligned}\log X_1 = f_{12.345}(X_2) + b_{13.245}(\log X_3) + b_{14.235}(\log X_4) \\ + b_{15.234}(\log X_5),\end{aligned}\right\} \quad (4)$$

where the several variables represent the series as listed in Table D in the appendix.

RESULTS OF ANALYSIS

The estimated direct cost was found to be related to percentage capacity operated, average hourly earnings, the price of steel scrap, and the efficiency of labor. The closeness of the relationship for the period 1920–34 was as given in Table 5.

[23] See "Iron and Steel," *U.S. Tariff Commission Report* (2d ser.; 1938), No. 128.

[24] Since the hours of labor required per ton of steel decline as the percentage of capacity operation increases, the measure of the efficiency of labor was derived as follows: Estimated total man-hours were computed by dividing wages paid by average hourly earnings. This total was divided by the production of finished steel to obtain man-hours per ton of product. The logarithm of man-hours per unit of product was then correlated with the logarithm of percentage capacity. The regression line was determined (by the graphic method) while taking trend into account. The vertical deviations from this line of regression were regarded as representing the variations in man-hours per unit not associated with differences in percentage of capacity operated. These deviations were then used as one factor in explaining total costs per unit. The antilogarithm of these deviations measured man-hours per unit of product, stated as a percentage of the man-hours expected for the current percentage of capacity operated (see "Man Hours of Labor per Unit of Output in Steel Manufacture," *Monthly Labor Review*, XL [1935], 1155).

The net regressions of cost on each of the several factors are shown in Figure 8. The standard errors of the regression curves were not calculated, but presumably they would be larger than the standard errors for the regressions based on the quarterly data because of the smaller number of observations.

The net regressions on average hourly earnings indicate that each increase of 10 per cent in average hourly earnings causes an increase of about 2 per cent in the direct costs of production; while the net regression on labor efficiency indicates that each reduction of 10 per cent in hours required per unit of product causes a reduction of 6 per cent in direct costs. This discrepancy

TABLE 5

Observations	Correlation $\bar{P}$	Standard Error of Estimate $\bar{S}$
15.....	0.92	+5.4 to −5.2 per cent

may be explained in part by the fact that earnings per hour are not precisely the same as wage rates per hour, since the composition of labor used shifts slightly with the level of steel operations. The regression on labor efficiency, however, is fairly consistent with the fact that pay rolls make up about 55 per cent of direct costs. In any case, the intercorrelation between the several independent series is so high that the regression of costs on wages and on efficiency can be regarded as only rough approximations.[25] The regresssion of cost on the price of scrap is as would be expected, with costs changing only slightly as scrap prices rise.

[25] The slopes of the several regressions shown in Figure 8 were given a final verification by correlating the readings from each of the curves with the dependent variable (method stated on pp. 305–6, equation 80, in Ezekiel, *op. cit.*). It was found that the highest correlation would be obtained if the slopes of the several curves were adjusted as follows: For plant capacity multiply by 1.13; for man-hours per ton multiply by 1.09; for average hourly earnings multiply by 1.24; and for price of steel scrap multiply by 0.99. This indicates a slightly higher effect for hourly earnings than the curve as shown, but only minor changes in the curves for the other factors. In view of the high probable error of each of the curves the adjustments have not been carried to the curves shown by the final graphic correlation. The adjusted correlation, $\bar{P}$, was increased from 0.92 to 0.97 by this final adjustment. The curves as plotted in Figures 8 and 13 are those before this adjustment.

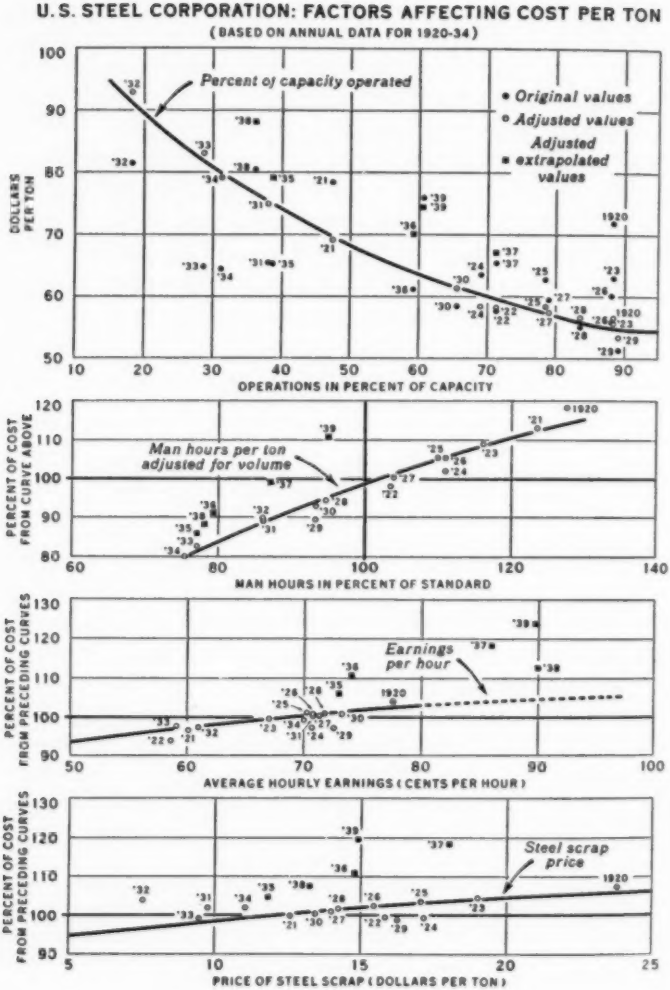
U. S. STEEL CORPORATION: FACTORS AFFECTING COST PER TON
(BASED ON ANNUAL DATA FOR 1920-34)
Percent of capacity operated
• Original values
○ Adjusted values
Adjusted ■ extrapolated values
DOLLARS PER TON
OPERATIONS IN PERCENT OF CAPACITY
Man hours per ton adjusted for volume
PERCENT OF COST FROM CURVE ABOVE
MAN HOURS IN PERCENT OF STANDARD
Earnings per hour
PERCENT OF COST FROM PRECEDING CURVES
AVERAGE HOURLY EARNINGS (CENTS PER HOUR)
Steel scrap price
PRICE OF STEEL SCRAP (DOLLARS PER TON)

FIG. 8

Approximately 85 per cent of the variation in direct costs per ton of finished steel produced was accounted for by the independent factors used. For the period of the analysis the errors in estimating cost from the regressions are not large except for the year 1932, when the error exceeds twice the standard error of estimate. The actual and estimated costs are shown in Figure 9. However, when the regressions are used to forecast the cost per ton in the years 1935–39, the errors are much larger, running to three and one-half times the standard error for the year 1937.[26]

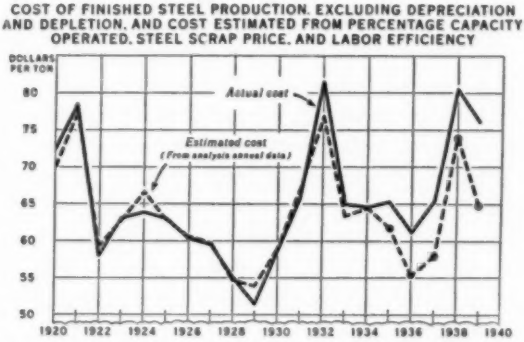

FIG. 9.—Estimated values 1935 through 1939 extrapolated from regressions based on 1920–34.

ANNUAL ANALYSIS OF COST USING TWO COMPONENTS

Since the U.S. Steel Corporation reports wages and salaries separately from other costs in its reports, it was also possible to analyze separately wage (including salary) costs per ton and costs other than wage costs. After several trials had been run, the following analyses were chosen as being the most significant.

The revenue concept of cost used in the other analyses of annual data was used here. Wages were taken directly from the reports of the Corporation. The "other-than-wages" figure is what is left when wages per ton are subtracted from the total direct cost per ton, as used in the other analysis of annual data. In analyzing other than wage costs, percentage of capacity operated and the price of steel scrap were used as independent factors.

[26] Table E in the appendix gives the observed direct cost per ton of finished steel produced and the estimated values.

For the study of wages the best results were obtained by using man-hours per unit of product as the dependent variable and percentage capacity and trend as independent variables. The estimated man-hours per unit from the regression was then multiplied by the average hourly earnings to get wages per ton. Here again the period 1920–34 was used to determine the regressions, with 1935–39 left free to test the reliability of the relations (see Table D in appendix for these data).

RESULTS OF ANALYSIS

Costs other than wage costs were found to be related to percentage capacity and the price of steel scrap, as shown in Figure 10. The analysis indicated that 46 per cent of the variation in costs other than wage costs is accounted for by these variables, with a standard error of estimate of 12 per cent. There is a fairly high correlation between percentage capacity and the price of steel scrap, so the slopes of the two regression curves are only an approximate indication of the true slopes. No significant trend was found, after these two factors were allowed for. When the regressions were used to estimate values for years subsequent to those included in the analysis, the errors were very small, not going over half the standard error of estimate.

Man-hours per unit of output was found to be related to percentage capacity and to a time factor, as shown in Figure 11. There is a downward trend in the number of man-hours required to produce a ton of steel, when changes in capacity operated are allowed for. The relationship between these factors was closer than for the other analysis, and the standard error of estimate a little smaller. Apparently, the independent factors explain 83 per cent of the variation in man-hours per unit ($\overline{P} = 0.91$). The standard error of estimate is 6.5 per cent to -6.1 per cent. When the regressions are used to forecast for 1935–39, the errors for the years 1935, 1936, and 1938 are small; but for 1937 the error is 17.6 per cent. This might be explained by the fact that 1937 was the year in which the steel industry was unionized, and there may have been a temporary increase in cost per unit due to the temporary effect on labor discipline.

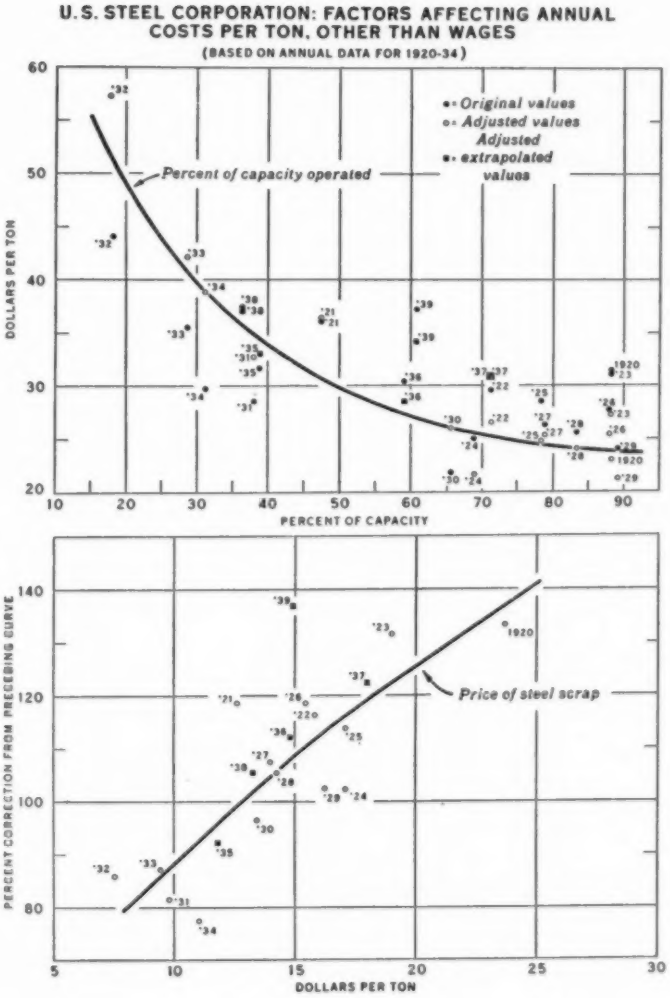
U.S. STEEL CORPORATION: FACTORS AFFECTING ANNUAL COSTS PER TON, OTHER THAN WAGES
(BASED ON ANNUAL DATA FOR 1920-34)
Original values
Adjusted values
Adjusted extrapolated values
Percent of capacity operated
DOLLARS PER TON
PERCENT OF CAPACITY
PERCENT CORRECTION FROM PRECEDING CURVE
Price of steel scrap
DOLLARS PER TON

FIG. 10

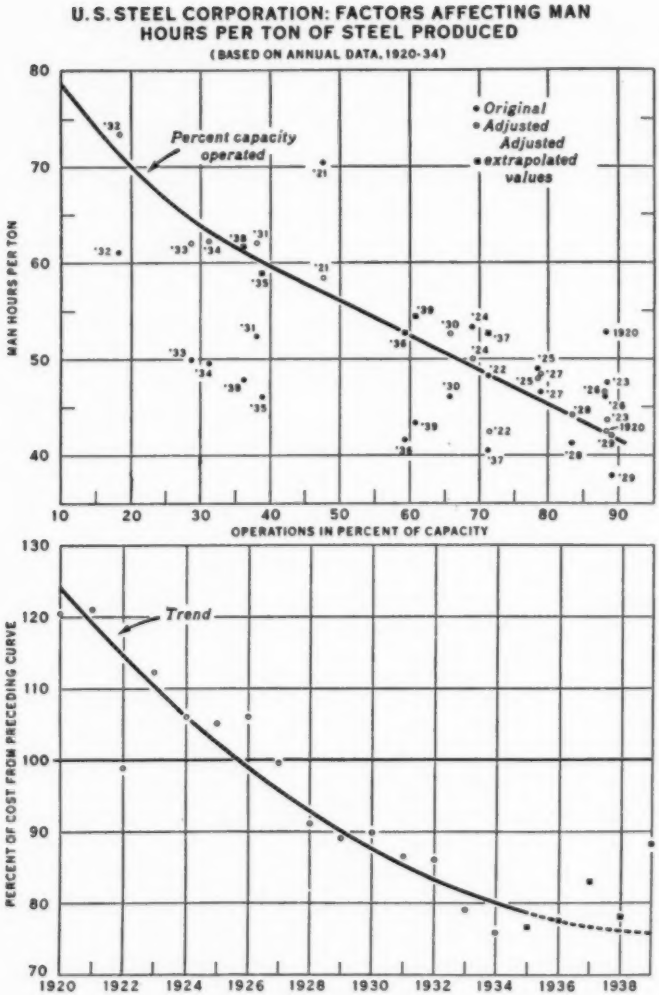
U. S. STEEL CORPORATION: FACTORS AFFECTING MAN HOURS PER TON OF STEEL PRODUCED
(BASED ON ANNUAL DATA, 1920-34)
MAN HOURS PER TON
80
70
60
50
40
Percent capacity operated
• Original
○ Adjusted
Adjusted • extrapolated values
10
20
30
40
50
60
70
80
90
OPERATIONS IN PERCENT OF CAPACITY
PERCENT OF COST FROM PRECEDING CURVE
130
120
110
100
90
80
70
Trend
1920
1922
1924
1926
1928
1930
1932
1934
1936
1938

FIG. 11

The estimated man-hours per unit were multiplied by the average hourly earnings for each year, and the resulting figure used to represent wage costs per ton. These estimates were added to those for costs other than wages to secure total direct costs per unit (see Table E in appendix for these data). When this derived cost is compared with the observed cost, the standard deviation of the differences is 3.95. With fifteen observations and ten degrees of freedom removed, this gives a standard error of estimate of 7.7 per cent.

TABLE 6

ESTIMATED AND ACTUAL TOTAL COST PER TON FINISHED STEEL PRODUCED, U.S. STEEL CORPORATION, 1920–38

Year	Actual Cost per Ton (Dollars)	Estimated Cost Using Analysis No. 2 of Total Direct Cost (Dollars)	Estimated Cost Using Combined Analyses of Direct Cost (Wages and Other than Wages) (Dollars)
1920	75.58	73.11	77.74
1921	83.12	81.40	75.02
1922	61.48	62.95	64.73
1923	66.51	66.37	63.24
1924	67.89	70.70	71.45
1925	67.14	66.96	66.11
1926	64.81	64.84	60.36
1927	64.13	64.25	62.14
1928	59.99	59.18	59.80
1929	55.59	58.11	58.91
1930	63.61	64.00	64.58
1931	72.21	73.63	73.54
1932	92.35	87.73	86.71
1933	72.77	71.37	73.73
1934	71.84	71.87	80.15
1935	71.72	68.29	74.15
1936	66.30	60.48	64.74
1937	70.34	62.68	63.45
1938	88.02	80.99	85.44
1939	82.39	70.29	73.40

Estimates of cost from annual data.—Adding the cost estimates obtained from the analysis of depreciation and depletion and those from the direct-cost analysis, total annual costs are obtained. The estimates for the two analyses of annual costs are given in Table 6. This table also includes the estimates for the

years after 1935, extrapolated from the formulas based on the preceding years. The errors in extrapolation were somewhat smaller for the combined analysis than for the simpler one.

Profits.—The comparison between estimated and observed profits from the analysis of the annual data was worked out in a manner similar to that used for the quarterly data. Estimates of profits using the total-cost analysis appear to follow actual reported profits more closely in the base years than do estimates based on the combined analysis. The estimate for 1937, however, was considerably out of line.

In order to present a cost curve from the composite analysis showing the relation between total cost and percentage of capacity operated, holding the other factors constant, it is necessary to add the estimates of depreciation, wage costs, and other costs together for whatever constant values of the other variables are assumed. This is the method used in calculating the cost curve shown in Figure 13.

COMPARISON WITH RESULTS PUBLISHED BY THE UNITED STATES STEEL CORPORATION

The correlation analyses of the relation of steel costs to volume of output presented above may be compared in several different ways with the analysis published by the United States Steel Corporation after this study was completed. In terms of closeness of fit the comparison is as shown in Table 7.

The analyses may also be compared with respect to how closely the annual profits of the Corporation could be estimated from the cost calculations. This comparison is shown in Table 8.

The standard error of estimate was lower for the U.S. Steel analysis than for any of the correlation analyses. Its accuracy in estimating profits, however, as judged from its absolute error in estimating total annual costs, was less than that of two of the earlier studies. The U.S. Steel analysis was based on much fuller and more accurate internal statistics than were the other studies. Comprehensive data were available with respect to actual average hourly earnings, composition of product sold each year, prices

actually received, etc. It would be surprising if these more accurate data had not yielded a result with less error of estimate.

TABLE 7

Solution	Period	Observations	Standard Error of Estimate (Percentage)
I. Quarterly data, direct costs	1929–38	38	−6.4 to 6.9
II. Quarterly data, direct costs	1932–38	26	−6.7 to 7.2
III. Annual data, direct costs	1920–34	15	−5.2 to 5.4
IV. Annual data, labor and other costs analyzed separately	1920–34	15	7.7
U.S. Steel*	1927–38	12	3.3

* The accuracy of the U.S. Steel analysis was based on the data given in Table 18 of their report (*Steel Prices, Volume, and Costs*, p. 24). This table gave the costs for various years, adjusted to 1938 conditions. Estimates of adjusted cost were computed from the equation derived in the study (cost = $182,100,000 + $55.73 per weighted ton shipped). The differences between these actual and estimated total costs were then used as representative of the differences between actual and estimated total profits for the Corporation. The method of analysis used in this study made it impossible to carry the estimates back to actual costs and estimated costs for conditions of each year separately. Had it been possible to do so, the absolute errors might have been slightly different, but the percentage errors (from which the standard error of estimate was computed) would have been unchanged. In transforming the standard deviation of these percentage errors into the standard error adjusted for the degrees of freedom removed, allowance was made for five constants involved in the U.S. Steel analysis. The equation used in that analysis was

$$b_2 T \left[\frac{P}{W} + \frac{O}{b_3 \left(\frac{L_2}{L_1} \right)} - b_4 P_s + R \right] = a + b_5 Q ,$$

where T = time in years, P = pay roll, W = average hourly earnings, O = "other costs," L = price level, P_s = pay roll for years when social security taxes applied, R = remaining costs, and Q = weighted tons of products sold. Values of the constants b_2, b_4, a, and b_5 were determined in the analysis, and a value of 0.5 was assumed for b_3 (*ibid.*, pp. 5–24).

TABLE 8

Solution	Annual Errors in Estimating Profits during Period Covered by Each Analysis (Data in Millions of Dollars)	
	Maximum	Average
II. Quarterly data, direct costs*	26.8	9.5†
III. Annual data, direct costs	38.0	13.73
IV. Annual data, combined costs	65.0	31.70
U.S. Steel	47.9	14.64

* Largest quarterly error multiplied by 4.

† Average quarterly error multiplied by 4.

The extent of final agreement between the rougher studies based on published data, and the subsequent study based on complete internal data, may be judged by comparing the cost curves derived from the several studies.

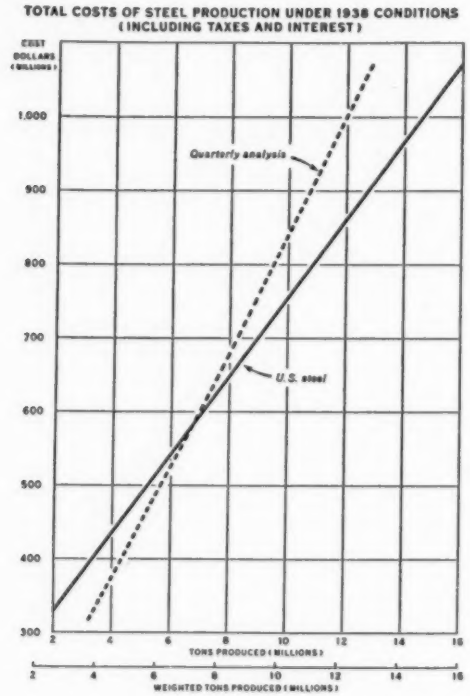

FIG. 12

In Figure 12 the cost curve derived from the analysis of the quarterly data is compared with the U.S. Steel curve; and in Figure 13 the cost curves from the two annual studies are similarly compared. (The curves in Figure 12 are total costs, including taxes and interest; the curves in Figure 13 are total costs excluding interest and corporation and social security taxes.) As contrasted with the cost curve published by U.S. Steel, the quar-

terly analysis gave a steeper curve, and the annual analyses gave curves which were less steep. The steeper curve for the quarterly analysis may have been due to the influence of serial correlations

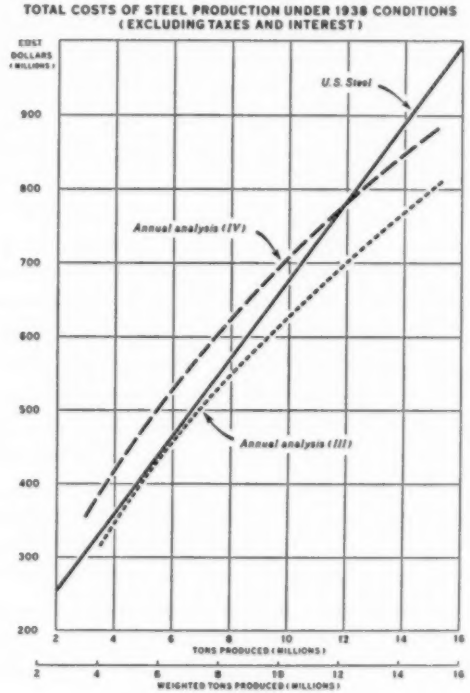

FIG. 13

in the quarterly data or to differences in the way that analysis was run and the curve computed.[27] In the range between four million tons and ten million tons, total cost from the simpler analyses did not depart from total cost according to the U.S. Steel analysis by more than sixty million dollars. In the higher

[27] Several problems are involved in this conversion. (1) The other analyses were based on actual tonnage of steel sold, while the U.S. Steel study employed a "weighted tonnage." In Figures 12 and 13 the U.S. Steel weighted tonnage is plotted on a different grid from the actual, according to the average relation shown

and lower ranges, much larger departures occurred. This is consistent with the standard errors of the regression curve as shown in Table 2.

The difference in level between the two annual analyses (Fig. 13) is due to the differential allowances for wage rate and labor efficiency in 1938—a year of high wage rate (and four years subsequent to the period on which the regressions were based for these two analyses). Had the comparison been made for an earlier year, say 1925 or 1928, the relative position of the curves might have been materially different.

CONCLUSIONS

1. Correlation analyses, based on published data of the U.S. Steel Corporation, have revealed the general character and extent of the Corporation's total cost curve. The curves obtained by several different analyses differ among themselves and also differ from a cost curve published by the Corporation after these analyses were completed. That analysis is based on much fuller and more precise information than was publicly available when this investigation was begun.

2. The fluctuation of the cost curve between the several analyses is consistent with the standard error of estimate for the regression curve. Apparently, the standard error of the regression provides at least a rough measure of the confidence which can be placed in such cost curves determined from the analysis of time series, even though all the assumptions on which probable error formulas are based are not fulfilled.

3. Published data covering the output and profit of industrial concerns producing relatively standard products, together with general data on wage rates and prices in their industries, when

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on p. 54 of *Steel Prices, Volume, and Costs*. (2) The method used in the quarterly analysis of estimating costs from profits and composite steel and iron prices precluded any direct computation of costs per ton of average products sold. Instead, an indirect computation was made, going from output to profits per ton at that output. The value of output at various quantities and 1938 prices was then computed, and the estimated profits subtracted to get estimated costs.

analyzed by multiple correlation analysis can provide at least a rough indication of the nature of the cost curve for such concerns.

4. In the case of the U.S. Steel Corporation, fluctuation in the percentage of capacity operated was the most important single factor associated with variations in costs per ton. Fluctuations in wage rates in general were accompanied by less than proportional variations in cost per ton or even in labor costs per ton. There was evidence of a sharp downward trend in labor requirements per ton, for given rates of output, from 1920 to 1934, with little apparent change thereafter. The regressions of costs on wage rates and labor efficiency were subject to a wide range of error because of high intercorrelation with other variables, however, and these conclusions are therefore only tentative.

5. The accuracy with which costs could be computed from the new analyses presented here was tested by extrapolation for several periods after those upon which each set of regressions was based. The cost curve published by the United States Steel Corporation has not been tested in this manner. It is to be hoped that the Corporation will continue to publish data broken down in the same way as in that study, so that the reliability of its analysis can likewise be tested by its application to data for years beyond those from which the results were determined.

APPENDIX

TABLE A

GENERAL DATA FOR THE STEEL INDUSTRY

Period	Average Price Products Sold* (Composite Price Iron and Steel) (Dollars per Ton)	Average Price Finished Steel† (Dollars per Pound)	Index Employment Iron and Steel‡ (1923–25 = 100)	Index Steel Production§ (1923–25 = 100)	Average Hourly Earnings‖ (Cents)
1929:					
1st quarter...	36.29	0.0255	101.4	128.0	86.0
2d quarter....	36.97	.0256	104.5	139.3	87.5
3d quarter....	36.60	.0255	105.4	141.3	85.0
4th quarter...	36.09	.0250	101.9	108.6	83.5
1930:					
1st quarter...	35.30	.0244	97.5	111.3	82.8
2d quarter....	33.95	.0226	95.5	104.3	83.4
3d quarter....	32.97	.0226	86.1	88.0	76.6
4th quarter...	32.01	.0220	80.5	70.0	75.0
1931:					
1st quarter...	31.67	.0222	75.6	72.6	74.0
2d quarter....	31.34	.0221	73.2	65.3	73.2
3d quarter....	31.04	.0220	68.3	51.0	64.8
4th quarter...	30.58	.0217	64.3	46.0	60.5
1932:					
1st quarter...	29.39	.0213	61.8	40.3	56.8
2d quarter....	29.29	.0217	58.1	29.0	54.0
3d quarter....	28.86	.0217	53.7	25.3	48.9
4th quarter...	28.66	.0215	55.8	30.0	48.8
1933:					
1st quarter...	28.01	.0211	53.5	27.3	48.4
2d quarter....	28.27	.0208	58.7	51.3	48.3
3d quarter....	29.98	.0218	74.8	81.3	53.5
4th quarter...	30.60	.0228	76.0	55.6	59.0
1934:					
1st quarter...	31.28	.0231	76.5	62.3	58.9
2d quarter....	32.87	.0249	84.0	82.6	64.2
3d quarter....	32.23	.0245	80.9	41.6	64.0
4th quarter...	32.21	0.0244	77.2	51.6	65.5

* Composite price of iron and steel published currently in *Survey of Current Business*, which in turn is taken from *Steel*. Represents unweighted averages of "per ton" quotations, which include, beginning with 1929: Pig iron (5 quotations) scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast-iron pipe.

† Composite price of finished steel, compiled by the American Metal Market and published in U.S. Department of Commerce, *Survey of Current Business*. Data represent averages of daily prices of 10 pounds of steel products weighted according to the importance of their production. The composite (as of January 4, 1937) includes the following: 2 pounds of bars; 1½ pounds each of plates, pipe, and sheets; 1 pound each of shapes, wire nails, and strips; and ¼ pound of tin plate.

‡ Bureau of Labor Statistics index of employment in blast furnace, steel works, and rolling mills.

§ Federal Reserve Board index of production of steel.

‖ Estimated for 1929–31, inclusive, from the Bureau of Labor Statistics indexes of pay rolls and employment. Data since 1932 are averages for blast furnaces, steel works, and rolling mills, reported by the Bureau of Labor Statistics.

TABLE A—*Continued*

Period	Average Price Products Sold* (Composite Price Iron and Steel) (Dollars per Ton)	Average Price Finished Steel† (Dollars per Pound)	Index Employment Iron and Steel‡ (1923–25 = 100)	Index Steel Production§ (1923–25 = 100)	Average Hourly Earnings‖ (Cents)
1935:					
1st quarter...	32.49	0.0244	84.0	77.3	66.6
2d quarter....	32.35	.0244	86.4	66.3	66.4
3d quarter....	32.65	.0243	86.8	77.6	65.9
4th quarter...	33.10	.0243	91.1	96.3	66.4
1936:					
1st quarter...	33.34	.0241	91.1	84.0	66.0
2d quarter....	32.94	.0236	96.2	105.6	66.4
3d quarter....	33.84	.0242	101.7	119.3	66.6
4th quarter...	34.81	.0248	106.8	135.6	68.9
1937:					
1st quarter...	37.74	.0266	110.9	131.4	73.3
2d quarter....	40.09	.0290	114.4	127.6	85.6
3d quarter....	40.18	.0290	115.5	135.6	85.3
4th quarter...	39.15	.0290	104.8	72.3	83.1
1938:					
1st quarter...	38.88	.0290	85.4	50.3	82.8
2d quarter....	38.51	.0289	85.2	47.6	83.7
3d quarter....	36.44	.0267	83.6	69.3	83.7
4th quarter...	36.41	.0267	89.0	100.3	84.1
1939:					
1st quarter...	36.38	.0268	95.2	91.7	83.5
2d quarter....	35.94	.0267	95.3	85.0	83.7
3d quarter....	36.15	.0261	97.8	105.3	84.6
4th quarter...	37.43	0.0264	120.1	153.0	84.7

TABLE B

PROFITS AND SALES OF U.S. STEEL CORPORATION, QUARTERLY

PERIOD	REPORTED NET PROFITS* (THOUSAND DOLLARS)		SALES IN TONS OF FINISHED STEEL* (THOUSANDS)	OPERATIONS IN PERCENTAGE OF CAPACITY†
	Before Depreciation	After Deductions for Depreciation and Depletion		
1929:				
1st quarter	60,105	+45,389	3,952	91.7
2d quarter	71,995	+56,076	4,390	101.2
3d quarter	70,174	+53,355	3,845	87.9
4th quarter	56,386	+50,541	3,061	69.4
1930:				
1st quarter	48,209	+35,792	3,486	78.4
2d quarter	45,665	+32,140	3,371	75.1
3d quarter	36,606	+24,206	2,761	61.0
4th quarter	21,683	+12,375	2,040	44.6
1931:				
1st quarter	18,100	+ 6,774	2,470	53.4
2d quarter	12,451	+ 7,400	2,296	48.7
3d quarter	7,828	+ 3,196	1,624	33.9
4th quarter	2,621	− 4,370	1,263	25.9
1932:				
1st quarter	− 2,475	−13,215	1,228	25.1
2d quarter	− 4,669	−14,561	1,058	21.7
3d quarter	− 5,795	−15,152	880	18.1
4th quarter	− 5,144	−14,395	813	16.8
1933:				
1st quarter	− 5,104	−14,708	818	17.0
2d quarter	3,584	− 7,024	1,395	29.0
3d quarter	10,542	− 882	1,945	40.4
4th quarter	4,268	− 5,925	1,604	33.3
1934:				
1st quarter	5,316	− 5,479	1,306	27.2
2d quarter	17,813	+ 7,344	2,373	49.3
3d quarter	2,516	− 7,708	1,118	23.3
4th quarter	2,509	− 8,038	1,129	23.5

* From quarterly reports of the Corporation, as summarized currently in *Standard Statistics Corporation Records* (New York). Profit figures have been adjusted so as not to take into account overhead expenses of the Lake Superior Iron Ore Properties, which expenses are normally included with cost of inventories but which were charged off in the Corporation reports during some years. Profits are before payment of parent-company bond interest.

† Recalculated from the annual data on percentage of capacity operated and the quarterly data on sales. The actual capacity as reported on January 1 of each year was used, and a straight-line interpolation made to estimate the capacity for each quarter (see Table C, first column). The percentage of capacity operated was then based on capacity for each quarter and quarterly sales.

TABLE B—*Continued*

Period	Reported Net Profits (Thousand Dollars)		Sales in Tons of Finished Steel (Thousands)	Operations in Percentage of Capacity†
	Before Depreciation	After Deductions for Depreciation and Depletion		
1935:				
1st quarter	11,174	− 221	1,785	37.3
2d quarter	12,871	+ 1,521	1,769	37.3
3d quarter	12,246	+ 648	1,787	37.9
4th quarter	19,196	+ 7,069	2,030	43.5
1936:				
1st quarter	16,446	+ 3,973	2,181	47.1
2d quarter	27,996	+13,416	2,850	62.1
3d quarter	28,967	+13,788	2,836	62.4
4th quarter	35,365	+20,654	2,957	65.7
1937:				
1st quarter	44,010	+28,565	3,698	82.5
2d quarter	52,394	+36,177	3,916	87.1
3d quarter	46,889	+30,621	3,343	73.7
4th quarter	17,494	+ 4,581	1,869	41.4
1938:				
1st quarter	9,879	− 1,289	1,565	34.2
2d quarter	9,124	− 2,614	1,445	30.9
3d quarter	9,506	− 2,380	1,578	33.0
4th quarter	10,244	− 3,801	2,038	41.4
1939:				
1st quarter	15,026	+ 661	2,235	45.1
2d quarter	14,944	+ 1,310	2,158	43.6
3d quarter	25,930	+10,420	2,465	50.0
4th quarter	46,480	+28,835	3,794	76.6

TABLE C

QUARTERLY DATA FOR CORRELATION ANALYSIS

Period	X_3 Capacity of U.S. Steel* (Thousand Tons)	X_2 Charges for Depreciation and Depletion† (Thousand Dollars)	X_4 Percentage of Capacity Operated‡	X_5 Average Hourly Earnings§ (Cents)	X_1 Cost of Production per Ton, Excluding Depreciation‖ (Dollars)
1929:					
1st quarter	17,230	14,716	91.7	86.0	21.08
2d quarter	17,355	15,919	101.2	87.5	20.57
3d quarter	17,490	16,819	87.9	85.0	18.37
4th quarter	17,635	5,845	69.4	83.5	17.66
1930:					
1st quarter	17,780	13,417	78.4	82.8	21.09
2d quarter	17,950	13,525	75.1	83.4	20.02
3d quarter	18,105	12,400	61.0	76.6	19.20
4th quarter	18,280	9,308	44.6	75.0	20.69
1931:					
1st quarter	18,505	11,326	53.4	74.0	23.78
2d quarter	18,840	5,051	48.7	73.2	25.34
3d quarter	19,150	4,632	33.9	64.8	25.46
4th quarter	19,480	6,991	25.9	60.5	27.41
1932:					
1st quarter	19,595	10,740	25.1	56.8	31.42
2d quarter	19,500	9,872	21.7	54.0	33.72
3d quarter	19,405	9,357	18.1	48.9	35.45
4th quarter	19,310	9,251	16.8	48.8	34.96
1933:					
1st quarter	19,260	9,604	17.0	48.4	34.60
2d quarter	19,260	10,608	29.0	48.3	25.90
3d quarter	19,260	11,424	40.4	53.5	24.57
4th quarter	19,260	10,193	33.3	59.0	27.92
1934:					
1st quarter	19,250	10,795	27.2	58.9	27.23
2d quarter	19,240	12,409	49.3	64.2	24.52
3d quarter	19,225	10,224	23.3	64.0	30.01
4th quarter	19,210	10,547	23.5	65.5	28.85

* Estimated from straight-line interpolation between annual data.

† Difference between profits before and after depreciation.

‡ See appendix, Table B.

§ See appendix, Table A.

‖ Calculated by subtracting the net profits per ton from the average composite price of iron and steel. Net profit per ton was calculated by dividing the net profits before depreciation by the number of tons of steel sold (see Tables A and B in appendix).

TABLE C—*Continued*

Period	X_3 Capacity of U.S. Steel* (Thousand Tons)	X_2 Charges for Depreciation and Depletion† (Thousand Dollars)	X_4 Percentage of Capacity Operated‡	X_5 Average Hourly Earnings§ (Cents)	X_1 Cost of Production per Ton, Excluding Depreciation‖ (Dollars)
1935:					
1st quarter	19,130	11,395	37.3	66.6	25.56
2d quarter	18,980	11,350	37.3	66.4	24.38
3d quarter	18,835	11,598	37.9	65.9	25.11
4th quarter	18,680	12,127	43.5	66.4	25.59
1936:					
1st quarter	18,530	12,473	47.1	66.0	25.82
2d quarter	18,350	14,580	62.1	66.4	23.12
3d quarter	18,170	15,179	62.4	66.6	23.63
4th quarter	18,000	14,711	65.7	68.9	22.86
1937:					
1st quarter	17,940	15,445	82.5	73.3	25.85
2d quarter	17,980	16,217	87.1	85.6	26.72
3d quarter	18,035	16,268	73.7	85.3	26.14
4th quarter	18,075	12,913	41.4	83.1	29.79
1938:					
1st quarter	18,300	11,168	34.2	82.8	32.45
2d quarter	18,700	11,738	30.9	83.7	31.77
3d quarter	19,100	11,886	33.0	83.7	30.42
4th quarter	19,700	14,045	41.4	84.1	31.38
1939:					
1st quarter	19,800	14,360	45.1	83.5	29.66
2d quarter	.....	13,634	43.6	83.7	29.02
3d quarter	.....	15,510	50.0	84.6	25.63
4th quarter	.....	17,645	76.6	84.7	25.18

TABLE D

ANNUAL DATA FOR CORRELATION ANALYSIS

Year	X_1 Cost per Ton Finished Steel Produced* (Dollars)	X_2 Percentage of Capacity Operated†	X_3 Average Hourly Earnings‡ (Cents)	X_4 Composite Price of Steel Scrap per Ton§ (Dollars)	X_5 Variation in Labor Efficiency**	Man-Hours per Unit of Products††
1920	72.31	88.3	77.5	23.71	127.5	52.74
1921.....	78.45	47.5	60.2	12.61	123.5	70.35
1922.....	57.85	71.3	58.5	15.83	103.5	48.25
1923.....	63.01	88.3	67.0	19.05	116.2	47.60
1924.....	63.73	69.0	70.8	17.15	111.0	53.30
1925.....	62.92	78.4	70.3	17.12	110.0	48.96
1926.....	60.33	88.0	70.8	15.48	111.0	46.06
1927.....	59.58	78.9	71.3	14.00	104.0	46.54
1928.....	55.17	83.4	71.8	14.29	94.8	41.24
1929.....	51.46	89.2	72.5	16.30	93.3	37.86
1930.....	58.57	65.6	73.2	13.45	93.3	46.04
1931.....	65.64	38.0	70.8	9.79	86.3	52.38
1932.....	81.40	18.3	61.0	7.54	86.1	61.13
1933.....	64.97	28.7	59.0	9.47	77.1	49.95
1934.....	64.57	31.2	70.0	11.07	75.6	49.58
1935.....	65.35	38.8	73.0	11.83	77.1	46.11
1936.....	61.15	59.3	74.0	14.82	79.4	41.54
1937.....	65.57	71.2	86.0	18.02	87.1	40.36
1938.....	80.52	36.2	90.0	13.27‖	78.3	47.78
1939.....	75.98	60.7	89.7	14.90¶	95.1	43.03

* Total revenue, excluding intercompany sales, as reported in annual reports of U.S. Steel Corporation minus profits available for the payment of taxes, bond interest, depreciation, divided by production of finished steel in tons. All data available in annual reports of the Corporation.

† As reported by the Corporation on January 1 of each year.

‡ As reported by U.S. Steel Corporation from 1933 through 1938. Prior to 1933 the figure is estimated from the relation between the average hourly earnings for the steel industry as reported by the National Industrial Conference Board (see Ada Beney, "Wages, Hours, and Employment in the U.S. 1914–36," *National Industrial Conference Board Study*, No. 229 [1936]), and U.S. Steel's reported figure from 1933 to 1938.

§ As reported in the *Survey of Current Business*. Based on No. 1 heavy melting-steel scraps, average of Pittsburgh, Chicago, and Philadelphia wholesale price quotation.

‖ Average of Pittsburgh and Chicago.

¶ Chicago price.

** The values tabled here are man-hours per ton, in percentage of expected man-hours per ton at the current percentage of capacity operated. Log of man-hours per ton of finished steel produced was correlated with the log of percentage capacity operated. The regression line was drawn in (by the graphic method), taking into account the trend. The vertical deviations of the original observations from the relation (expressed in logs) are used as an indication of the trend of efficiency, after allowing for the effect of percentage capacity on the efficiency of labor.

†† $\text{man-hours} = \frac{\text{wages and salaries}}{\text{average hourly earnings}}$; $\text{man-hours per unit} = \frac{\text{man-hours}}{\text{production finished steel}}$.

TABLE E

ESTIMATED AND ACTUAL DIRECT COST PER TON FINISHED STEEL PRODUCED FROM ANALYSES OF ANNUAL DATA

Year	Cost per Ton Finished Steel Produced (Dollars)	Estimated Cost from Total Analysis (Dollars)	Error in Estimate (Dollars)	Estimated Cost, Combined Results from Separate Analysis (Dollars)	Error in Estimate (Dollars)
1920	72.31	70.00	+ 2.31	74.63	−2.32
1921	78.45	77.42	+ 1.03	71.04	+7.41
1922	57.85	59.30	− 1.45	61.08	−4.03
1923	63.01	62.80	+ 0.21	59.67	+3.34
1924	63.73	66.55	− 2.82	67.30	−3.55
1925	62.92	62.80	+ 0.08	61.95	+0.97
1926	60.33	60.65	− 0.32	56.17	+4.14
1927	59.58	59.70	− 0.12	57.59	+1.99
1928	55.17	54.70	+ 0.47	55.32	−0.15
1929	51.46	53.80	− 2.34	54.60	−3.14
1930	58.57	59.00	− 0.43	59.58	−1.01
1931	65.64	67.00	− 1.36	66.91	−1.27
1932	81.40	76.70	+ 4.70	75.68	+5.72
1933	64.97	63.40	+ 1.57	65.76	−0.79
1934	64.57	64.42	+ 0.15	72.70	−8.13
1935	65.35	61.80	+ 3.75	67.66	−2.31
1936	61.15	55.35	+ 5.80	59.59	+1.56
1937	65.57	57.95	+ 7.82	58.72	+6.85
1938	80.52	74.00	+ 6.52	78.45	+2.07
1939	75.98	64.70	+11.28	67.81	+8.17

JOHN R. COMMONS' CONCEPT OF TWENTIETH-CENTURY ECONOMICS

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I. COMMONS' VIEWS ON THE NATURE OF ECONOMIC SCIENCE

THE development of institutional economic thought in the United States has proceeded to a point where foreign observers are now coming to regard institutionalism as one of the most vigorous trends in this country's recent economic thinking. Writing in 1937, Lionel Robbins tells us in his *An Essay on the Nature and Significance of Economic Science* that "in recent years, if they [the institutionalists] have not secured the upper hand altogether, they have certainly had a wide area of power in America." Many outstanding American economists have acknowledged a debt to the stream of institutional economic thought, which was originated in this country by Thorstein Veblen in the closing decade of the nineteenth century. Those who have been either in or very close to the stream of institutionalism include such economists as W. C. Mitchell, J. R. Commons, J. M. Clark, W. H. Hamilton, G. C. Means, M. Ezekiel, I. Lubin, R. G. Tugwell, and many others. Among those economists who have been generally classed as exponents of institutional thought, John R. Commons is the only one who has written extensively on the nature and scope of institutional economics. The other economists, who, in contrast with Commons, have been influenced by Veblenian economics, have made scattered references in their essays and treatises to the methodology and scope of institutionalism, but none of them has devoted any extended discussion to the scientific basis of the new trend in American economic thought. In a recent article entitled "Twentieth Century Economics"[1] John R. Commons once more presents a discussion of the basic general-

[1] Commons opens his article with the statement that "economics is a department of Social Philosophy" (see *Journal of Social Philosophy*, V [1939], 29).

izations of what he takes to be institutional economics. This article is a restatement, with some new emphases, of the lengthy discussion of the nature of economic science in Commons' *Institutional Economics*, which presents the only extended defense of the institutionalist's position since Veblen wrote his critical essays at the beginning of the present century. As Commons is one of the leading exponents of the institutionalist group, an analysis of his views on the nature of economic science is of considerable interest to the student of economic thought.

On first inquiry Commons appears to differ from orthodox economists in a number of important respects. The philosophical foundation of his institutional economics is a form of social voluntarism which is quite unlike the individualistic liberalism of the nineteenth century. His theory of human nature seems to be far removed from the rationalistic interpretation of human behavior supplied by the neoclassical economists. Also, his theory of social organization gives greater attention to the cohesive force of customary and collective behavior than does the social theory of the followers of Alfred Marshall. In addition, the methodological approach of Commons is much more inductive and experimental than the scientific approach of economic orthodoxy. All these significant differences between the theoretical positions of Commons and the neoclassicists with respect to philosophical, psychological, and methodological matters stem from a fundamental disagreement relating to the proper scope of economic science. When Commons pushes the boundaries of economic science beyond individual behavior into the realm of collective action in control of individual action, he is faced with the need of a wider social philosophy, a more pragmatic methodological approach, and a theory of human nature which takes account of the irrationality of customary behavior. The wider field of economic and social data to which Commons devotes his analysis cannot be satisfactorily handled by the heuristic devices of the orthodox economist. Consequently, Commons makes whatever adjustments are necessary in his theoretical tools and his framework of interpretation to enable him to treat adequately the larger field of economic data which he has in mind as the proper scope of his science. If Com-

mons' views on the scope of economic science are accepted, then agreement with his philosophical, methodological, and psychological views more readily follows. The paramount question for consideration is, then, whether or not Commons is justified in broadening the scope of economic science to the extent to which he has done so. In this analysis of Commons' concept of economic science our attention will be primarily directed toward his views on what should be the proper scope of economics.

II. THE NATURE OF ECONOMIC DATA AND THEIR FRAMEWORK OF INTERPRETATION

In explaining his views on the methodology and scope of institutional economics Commons begins with an examination of the nature of the data of the social and natural sciences. The subject matter or data of science he divides into three general categories. There are, first, the data of the physical sciences which have as their unifying principle the concept of mechanism. Commons defines a mechanism as a system or entity which functions in accordance with the "natural movement of atoms, waves, or vortexes" and which is acted upon by the blind forces of nature. Although these natural forces act without "cause, effect, or purpose, like the waves of the ocean," all mechanisms tend toward some form of equilibrium. As a consequence of this equilibrating tendency of natural science data, the analysis of the subject matter of the natural sciences has a frame of reference which is woven about the concept of a mechanistic equilibrium. Turning to the biological sciences, one finds a different situation, for the subject matter of these sciences displays the characteristics of an organism instead of a mechanism. An organism is a structure or organization, which, unlike a mechanism, exhibits the property of life or activity and whose activities are carried on through a number of mutually dependent parts. Whereas a mechanism functions as an equilibrium, an organism operates as a process. The concept of mechanism emphasizes the notion of repetivity, but the organism concept draws special attention to the phenomena of change. As soon as the notion of change is introduced into a field of scientific data, attention is drawn to the problem of a se-

ries of changes over a period of time. The investigator is then brought to a consideration of the concept of evolution. Commons is careful to point out, however, that the evolution to be observed in the realm of biological data is the result of "unintended or accidental changes." The biological process contains nothing of the nature of human purpose; and in this respect it is not fundamentally different from the mechanical movements which result in an automatic equilibrium.

The data of the social sciences differ from those of the natural and biological sciences, for social science data contain the element of human purpose in many forms. As Commons puts it:

> The subject matter with which an economist deals is not a mechanism or organism whose notions the investigator cannot *understand*—it is human beings whose activities he can fairly well understand by putting himself "in their place" and thus constructing the "reasons," in the sense of motives or purposes, or values, of their activity under all the variable conditions of time and place.[2]

Although the concepts of equilibrium and process, which are borrowed from the natural and biological sciences, are used by the social scientist in arriving at an understanding of human behavior, these concepts are modified in important respects. Instead of "unintended or accidental changes," the social scientist in his analysis of social science data finds "intended or purposeful changes." Also, in place of the automatic equilibrium of the physical sciences, he discovers what Commons calls a "managed equilibrium." Commons states that the social process, under the direction of human wills, moves from one cultural equilibrium to another down through the course of historical change. In the course of this evolution the natural selection of Darwin's biological evolution becomes the artificial selection of purposeful social control. The subject matter of the social sciences is thus something more than a combination of equilibrium and process, for it incorporates the unique element of human purpose which Commons calls "willingness." Society is neither a mechanism nor an organism; it is collective action in the form of a going concern

[2] *Institutional Economics* (New York, 1934), p. 723.

operated in accordance with human designs.[3] Since social science data are impregnated with human purpose or "willingness," Commons declares that this element of voluntariness in social science data places the social sciences in a category which is quite distinct from the category of the physical and biological sciences. Furthermore, he feels that it is because of this unique characteristic or quality of voluntarity that social science data require a special treatment not accorded to the data of the nonsocial sciences. For this reason he shifts his analysis from the concepts of mechanism and organism to the concept of going concern, which reflects the voluntarity of economic data. The going concern—whether it be the economic system, an economic institution, or a corporative enterprise—is essentially purposive in its nature, is directed by the human will, and is always looking to the future. As we shall explain, it is not unusual that Commons should come to call his institutional economics "the science of futurity."

Commons finds that the data of the social sciences, which have the concept of the going concern as their unifying principle, reveal another fundamental element not to be found in the case of the data of the natural and organic sciences. Besides the quality of voluntarity, he finds that social science data exhibit the quality of historicity. This is the case because the investigations of the social scientist deal with a reality which is a part of a historical process. As Commons himself expresses it: "The method of investigation must therefore be different from that of the exact sciences because its outcome is the concerted but conflicting action of human wills in an historical evolution of determining what is workable within the changing economic, political, and ethical sequence."[4] Economic reality relates to an economic system which is passing through a historical evolution; and, if the data of the economist are to be of any real help in interpreting the historical realities of the economic order, they cannot, in the ultimate analysis, be deprived of their quality of historicity. In the han-

[3] For a development of this view of economic society see A. G. Gruchy, "The Concept of National Planning in Institutional Economics," *Southern Economic Journal*, October, 1939, pp. 121–44.

[4] *Institutional Economics*, p. 719.

dling of economic data, abstraction should not be carried to the point where all or most historical significance is lost. Commons would therefore regard economics as a historicocultural science. He agrees that for some purposes economic analysis may properly be more deductive than empirical, but abstraction and the desire for logical consistency should never be carried so far as to reduce economics to the status of a nonhistorical science.

As soon as Commons satisfies himself that the voluntarity and historicity of social science data are such unique qualities that social and nonsocial sciences are to be regarded as essentially different scientific disciplines, he is immediately confronted by a very important methodological problem. This problem arises from the fact that human purpose is subjective and that historical events are unique. Consequently, he has the very difficult task of constructing a science on the basis of what appear to be highly subjective and unique data. It is usual for scientists to declare that their investigations are scientific because they deal with data that may be objectively investigated and tested and which exhibit certain definite uniformities of behavior. Unless the data can be observed, tested, and measured and unless they are found to recur, there can be no basis for useful scientific generalizations of any kind. As this is not a matter which has escaped Commons' notice, he is acutely aware of this methodological difficulty. In his *Institutional Economics* Commons states that "here we recognize, however, that there can be no science of political economy if the will is free, in the sense of being wholly capricious and undetermined. This requires us to look for uniformities in the operation of the will, if we would have an economic science. . . . ."[5] He is quick to agree that an economic analysis which is based upon the mere subjectivity of human volition and the uniqueness of historical events would be more metaphysical than scientific.

The nineteenth-century economists met the problem of the voluntarity and historicity of economic data by subjecting their data to a great deal of abstraction. Economic data were selected and refined until they related primarily to the behavior of purely rational beings. In this situation individuals made their personal

[5] P. 739.

valuations and pursued personal ends with a uniformity of behavior which was amenable to a limited form of scientific treatment, since all valuations and realizations of human purpose were only those of thoroughly rational individuals. The neoclassicists thus created a thought system in which the economic order was taken to be a highly individualistic and competitive economy. Commons asserts that the defect in the theoretical position of the nineteenth-century economists was that they carried their abstraction too far in an effort to refine economic data and to make them more tractable for purposes of scientific generalization. As a consequence, their scientific analysis came to lack the essential quality of historicity.

In place of the abstract thought structure based on the concept of a competitive equilibrium, which became the framework of interpretation of the neoclassicists, Commons substitutes a thought structure or theoretical schema based on a view of the economic system as a process or going concern. In Commons' analysis the orthodox economist's view of the economic system as a competitive equilibrium is replaced by "an adequate and therefore complex formula of transactions whose expected repetition, concurrence, and variability are a going concern." This "formula" or thought system in which the economic system is taken by Commons to be a going concern is a part-whole relation or over-all view that provides Commons with the necessary frame of reference in his analysis of the object and relations comprising the whole of the economic order. What keeps the economic system as a going concern together is not only individual self-interest but also controlling patterns of customs and habitual behavior. As Commons explains the situation,

> Precedent and statute are distinguishing marks of going concerns, *but custom and habitual assumptions are the underlying principle of all human relations*. . . . . They are a law of human nature in that they go to a fundamental and ultimate principle without which man cannot live in society—the principle of Security of Expectations. It is not justice, nor even happiness, that is fundamental—it is security, even the security of injustice and poverty.[6]

[6] *Ibid.*, p. 705. (Italics mine.)

Commons does not eliminate individual self-interest as a cause of human behavior from his "formula" or thought schema. Instead, he subordinates it to what he believes to be the still more fundamental principle of customary behavior or security of expectations, which limits the area within which individual self-interest may operate. What is the subject of Commons' attention is therefore not a highly competitive economy of individual action but a "great complexity of forces." This complexity of customary and collective forces of the nature of a going concern displays a considerable amount of uniformity in the form of collective action in control of individual action.

Commons points out that no science requires absolute uniformity in its data as a basis for the making of scientific generalizations, and especially is this true of economics whose subject matter reveals considerable variability. The transactions of going concerns, of the various institutions which comprise the capitalistic economy, are never cases of exact repetition. However, repetition in the form of customary individual and collective behavior is the norm, and variability of behavior is the exception. The "difficult problem" of economic science, in Commons' opinion, is so to correlate the principles of customary action at work within the economic system that whatever variabilities appear may be explained not as the unpredictable or inexplicable caprices of individual wills but as the changing interrelations of the several factors which comprise the cultural complex known as capitalism.

Commons' concept of the formula, as an over-all view or part-whole relation providing a framework of reference for the economist in his analysis of economic data, is similar to Max Weber's concept of the ideal type of capitalism. In developing his ideal type of capitalism, Weber's aim is to reduce a particular historical period or epoch, by a process of limited abstraction, to a thought system which will provide the necessary framework of interpretation for the study of the historical period under consideration. As Commons points out, an economist's type form or thought structure is not economic reality itself, because a certain amount of analysis involving abstraction has been indulged in by the economist in developing his thought schema. The ideal type or theoretical

schema of Weber for the interpretation of capitalistic activity is a historical concept unlike the abstract-ideal type of the competitive system of the nineteenth-century economists, since abstraction from empirical data has not been carried by Weber so far as to eliminate the historical significance of his economic data.

The formula or thought schema which Commons develops for the interpretation of economic data differs in a number of important ways from the thought schema of Max Weber. Weber's ideal type of capitalism is defective, according to Commons, because it is constructed upon too narrow a basis of motivation. In Weber's analysis the drive within the capitalistic system flows from the "capitalist spirit," which is explained to be the striving for an unlimited supply of pecuniary values without any real sense of obligation toward the community. Commons feels that Weber has erred, like the classical and neoclassical economists, in providing too simple a motivation for the capitalistic system. For this reason he believes that Weber's ideal type is much too subjective to be a heuristic device of any great value to the economist. It is not sufficiently objective to provide a basis for a scientific analysis of the historical reality which has developed into the present form of capitalism. Weber's ideal type provokes too much disagreement among economic investigators; and, in addition, it prevents the development of that "voluntary consensus" of scientific opinion which is necessary if economics as a science is to progress and if economics is to become a useful tool in the improvement of economic conditions. Commons feels that Weber is much too "pedagogic" and not sufficiently "pragmatic" in his approach to the analysis of modern capitalism.

In constructing his formula or thought schema of capitalism Commons would shift the emphasis from the "capitalist spirit" to the capitalist system. He would substitute a thought schema of capitalism as a special historical stage which derives its movement from a variety of motives and circumstances. He would make his formula much more elastic than Weber's ideal type; and, in addition, he would put the emphasis primarily upon transactions and only secondarily upon subjective motives such as the "capitalist spirit." Furthermore, Commons would avoid the fixity of Weber's

ideal type of capitalism by having his formula more of a process and less of a structure. As we shall see, the basis of Commons' formula or thought schema for the interpretation of modern capitalism is his concept of the going concern. Where Weber emphasizes structure, Commons will be found to emphasize function. Weber was more interested in the evolution of capitalism as a pure type than in the future changes which capitalism might undergo as the result of the working-out of technological and economic tendencies. Thus, the interests of Commons and Weber are decidedly at variance with one another. Commons criticizes Weber on the ground that the latter preferred to eliminate those facts which did not fit his ideal type of capitalism rather than to alter the ideal type so that adequate provision might be made for the aberrant data. Weber's ideal type degenerates into a static hypothesis of the structure of capitalism, whereas Commons' formula becomes a dynamic hypothesis of a "moving, changing process . . . . a formula for expressing the uncertain expectations of the future which dominate the activity of human beings in the ever-moving present."[7] Commons states that his formula of capitalism as a going concern is elastic, objective, and transactional. It is transactional because its primary interest is in the "economic bonds" such as transactions, debts, and property relations which bind individuals and groups together and which give rise to the many varieties of economic transactions comprising the capitalistic system. Since these transactions are largely customary in nature, the capitalistic process is held together as a going concern not only by the classicist's principle of self-interest but also by the stronger force or pressure of customary collective action in control of individual action. As Commons himself puts it, "the methodology of recent economic science requires us to look further—indeed to set up an ideal type, or formula, of a social force or pressure which compels individuals to conform, in variable degrees of conformity, and which can itself be investigated in its own right, over and above the presupposition of [individual] habit."[8]

[7] *Institutional Economics*, p. 733.

[8] *Ibid.*, p. 740.

The fundamental difference between Weber and Commons can be explained by inquiring into their definitions of custom. Weber develops a concept of custom which takes it to be something that comes down from the past. In Commons' economic analysis the concept of custom is one which relates more to the future than to the past.[9] For Commons a custom is not so much an inherited way of doing things as a course of action or way of doing things which gives the individual a security of expectation with reference to the future actions of other individuals and groups. He takes the essence of customs to be their futurity and not their inheritability. In this view of the nature of custom the economic system as a going concern is dominated by expectations of the future, since the purpose of customary behavior is to give some guaranty to the individual concerning future conditions. As Commons explains, it is the expectations of the future which guide present behavior; and it is this futurity which becomes his scientific substitute for Weber's inward spirit of the capitalistic system.

III. COMMONS' VIEWS ON THE SCOPE OF INSTITUTIONAL ECONOMICS

After inquiring into the nature of economic data and developing his concept of the formula as a unifying principle for his data, Commons goes on to discuss the relations that exist between his views on the nature of economic data and his views with respect to the scope of economic science. It soon becomes evident that there is a very close connection between his "formula" of the economic system as a going concern and the scope of his institutional economics. In broadening the scope of economics to include a study of the economic system as a going concern, Commons views the economic system as an emerging process which has passed through a number of stages in its development. In his historical

[9] As Commons explains in his *Institutional Economics* (p. 740), institutional economics "brings in another principle peculiar to the social sciences which is not found in the older concepts of Habit, or Custom. This is the principle of expectation which we name Futurity. Habit is a repetition of acts, determined—if they be 'determined'—by physiological processes that occurred in the past. But the binding, or 'determining' force of custom is the similarity of expectations of gain or loss imagined in the future."

view of the economic order Commons distinguishes the three economic stages of scarcity, abundance, and stabilization.[10] The stage of scarcity, which preceded the industrial revolution, was one of little individual liberty along with a great deal of governmental control at a time when national welfare was subordinated to the demands of a war economy. The following stage of abundance covered the first hundred years of the industrial revolution. This was the era of "employer capitalism" when the manufacturer found himself at the helm of the economic system. In this age of abundance and relative freedom from disastrous wars there was a maximum of individual liberty of action and a minimum of governmental interference with the direction of economic activity. After 1850, however, there was ushered in the present stage of stabilization which coincides with the appearance of concerted movements among capitalists and laborers. The earlier stage of "employer capitalism" now becomes the era of "banker capitalism"—an era of widespread stabilization movements in which each vested interest seeks to protect its own position as against all other competing interests. Once more restraints are placed upon individual liberty not only by the government but also by corporations, unions, and associations of merchants, farmers, and bankers. Thus, the current stage of capitalistic activity develops into a situation where there are to be observed widespread collective efforts to control individual action. No longer is the disposal of the scarce means of production a matter of individual behavior and the choice of individual ends and aims. The disposal of a nation's scarce commodities is now being carried on by collective action in control of individual action in accordance with whatever collective purposes or ends happen to be most dominant at the time.

The subject of Commons' analysis is thus the emerging economic system which has passed through a number of stages since the breakdown of the medieval economy of western Europe. When Commons divides the historical process into these various economic stages, he fashions a formula or thought schema for the interpretation of each era. The economic era which is of special

[10] *Ibid.*, p. 773.

interest to him is the most recent stage of "banker capitalism," which embodies within itself the possibility of change in a number of different directions. Commons' formula for the interpretation of the evolutionary course of economic development reflects all the dynamic nature of the evolving economic system. His formula develops along with the changing economic system, since as a framework of interpretation it incorporates all the factors leading to the further development of the capitalistic system. As he explains in his recent article on "Twentieth Century Economics," the present stage of "banker capitalism" may develop into a form of "reasonable capitalism" which would be a stabilization of the economic system based on the protection of community welfare as opposed to private profit. It is quite possible, however, that the present economic stage may degenerate into some form of economic dictatorship such as Italian fascism or Russian communism. In looking to the future, Commons' formula of capitalism as a going concern contains a number of ethical elements which bring up the whole question of the economic ends of social organization. As will become apparent at a later point in our analysis of Commons' economics, the ethical element in his formula of capitalism is of considerable importance in determining his views on the proper scope of economic science.

The scope of institutional economics, as understood by Commons, would thus include an analysis of the economic order as a going concern "on the make." In the various stages of economic development Commons observes five fundamental principles at work conditioning, limiting, and directing the complex of economic transactions comprising the capitalistic system. The scope of institutional economics would include "the total of all human acting and transacting within the limiting and complementary interdependence of the principles of scarcity, efficiency, working rules, sovereignty, and futurity."[11] The principle of efficiency relates to the managerial transactions of business enterprise. These managerial transactions are technological in importance and are concerned with man's relation to his material environment. This is the field of "engineering economics," where production of com-

[11] *Ibid.*, p. 738.

modities and not ownership is the primary consideration. The principle of scarcity, however, carries the economist out of the field of "engineering economics" into what is called by Commons "proprietary economics." This type of economics has as its major problem not the production of goods but the transfer of their ownership.[12] As a limiting factor, scarcity relates to the scarce factors of production which place their owners in strategic positions to bargain for shares of the national income. Since ownership measured in monetary units is of much more importance than physical wealth or commodities measured in man-hours of labor, each owner of a productive agent seeks to maximize his pecuniary values at the expense of other economic interests.

In addition to the principles of efficiency and scarcity there are the principles of customary working rules and sovereignty. Working rules refer to the customary regulations and restrictions imposed by corporations, labor unions, farmers' co-operatives, trade associations, consumers' organizations, and other going concerns upon the individuals who participate in the transactions of these various going concerns. Sovereignty relates to the power of the government and its various agencies, such as the courts and administrative commissions, to coerce individuals by means of various sanctions into acceptance of community standards of business conduct. Commons tells us that "the human will is unreliable and must be coerced by custom or government." He investigates coercion by custom by introducing the principle of working rules. Coercion by government is examined in the light of the principle of sovereignty, which finds expression through the exercise of police power. Both principles reveal that the order to be observed in economic society is the result of coercion or pressure by custom and government and not of the forces of individualistic competition. The final principle, in the light of which the various transactions comprising the going concern called capitalism are to be investigated, is that of futurity. According to this principle, eco-

[12] Commons' distinction between "engineering economics" and "proprietary economics" is reminiscent of Veblen's distinction between the industrial and pecuniary employments (cf. T. Veblen, *The Place of Science in Modern Civilisation* [1919], pp. 279–323).

nomic transactions are performed in the present but "with reference to future events as expected hindrances, aids, or consequences." Whereas the principles of customary working rules and sovereignty deal with the factors that give order and stability to the economic system, the principle of futurity is concerned with the ends of concerted economic action. Futurity is thus the factor which leavens the going concern—that great complex of collective action and customary behavior. It gives expression to the quality of voluntariness that runs so conspicuously throughout all economic data. All five principles of economic analysis are subsumed by Commons under the single over-all principle of willingness. This general principle covers the totality of the behavior of individuals in all their economic transactions.[13] According to the principle of willingness, the human will-in-action directs economic activity and utilizes the five principles in order to increase the future output of goods and services for the nation as a whole or to acquire a larger share of the national output for particular individuals or groups, depending upon whatever private or social purposes are uppermost at the time. If minority interests rather than community interests are dominant, then the five principles will be utilized for private profit rather than for community welfare. However, as social intelligence becomes better organized, the five principles developed by Commons may be increasingly employed for the expansion of general economic welfare. Institutional economics as viewed by Commons thus passes on from the materialistic theory of commodities of the classical economists and the subjective theory of sensations of the marginalists to a "volitional theory of economic activity directed towards purposes in the future." Institutional economics becomes a form of "volitional economics."

Commons presents two major objections to the views of the members of the neoclassical school of economic thought relating to the scope of economic science. He maintains that orthodox economics cuts off too small a portion of economic experience in limiting its analysis to the study of what one of the outstanding representa-

[13] *Institutional Economics*, p. 738.

tives of neoclassicism in England has taken to be the scope of economics, namely, the study of "human behavior as a relationship between ends and scarce means which have alternative uses" in an economy of individualistic action.[14] Commons would push the boundaries of economic science beyond individual action into all those fields of collective action which have any significance for economic understanding or interpretation. In his autobiography Commons informs us: "I always thought that both political science and sociology were branches of political economy. I broke over without compunction into those departments, when they were separated from economics in the teaching curriculum."[15] In neoclassical economics the scope of the science is delimited, as explained by Lionel Robbins, by taking the technical and social environment, as well as human ends, as data. Given a certain stage of technological development and a certain scheme of human valuations, the major problem for the neoclassicist is "the study of the disposal of scarce commodities" in this given social situation. In this view of the scope of economics the economist inquires into neither the causes of technological change and their effects upon economic activity nor the relations between economic activity and the great social institutions which dominate all economic life. Furthermore, the economist does not inquire into the reasons for changes in the scheme of human ends and purposes. Such problems are beyond the scope of economic science as it is understood by the neoclassicist, since they fall within what Robbins has described as the "sociological penumbra." It must be pointed out that the neoclassicist does not ignore the importance of these sociological problems. He merely states that they are not properly within the province of economic analysis.

Commons would expand individual action concerned with the disposal of scarce means to include various forms of collective behavior in control of individual conduct. Thus he would carry his analysis into the "technical and social environment" where are to be found many forms of institutional behavior. The origin, de-

[14] Lionel Robbins, *An Essay on the Nature and Significance of Economic Science* (London, 1937), p. 16.

[15] *Myself* (New York, 1934), p. 44.

velopment, and future trends of social institutions, which have a bearing on man's disposal of scarce means, fall within Commons' scope of economic science. Early in his *Institutional Economics* Commons informs the reader that

> collective action, as well as individual action, has always been there; but from Smith to the Twentieth Century it has been excluded and ignored, except as attacks on trade unions or as postscripts on ethics or public policy. The problem now is not to create a different economics—"institutional" economics—divorced from preceding schools, but how to give to collective action, in all its varieties, its due place throughout economic theory.[16]

In this manner Commons looks forward to the widening of the scope of economics and to the development of a "rounded-out theory of Political Economy." He would break through the limitations placed on the scope of their science by the neoclassical economists. In this widening of scope his only guide would be the extent to which the inclusion of new fields of data would aid in improving our understanding of economic reality. In this matter of the scope of economic science Commons comes very close to the position of J. M. Clark, who, in speaking about the proper boundaries of economic science, asserts:

> Unless they have been finally and authoritatively established in some writing which has escaped my notice, I feel free to contend that it is less important to keep inside any traditional limits than to follow our natural questionings wherever they may lead, and do whatever work we are specially fitted for and find undone. . . . . Economics can certainly not follow a policy of Jeffersonian nonintercourse toward other fields of knowledge. The ultimate problems in which humanity is interested are not those of social value in the sense of value in society as registered by market standards. Men are interested in the values of things *to* society, and they rightly demand that economics should contribute to the solution of these problems. Our studies of exchange value are destined to be judged by this broader criterion, and we might as well prepare them with this in mind.[17]

As exponents of institutional economic thought both Commons and Clark have no hesitation in plunging into Robbins' "sociological penumbra."

[16] P. 5.

[17] "Toward a Concept of Social Value," in his *Preface to Social Economics* (New York, 1936), pp. 60–61.

The second objection which Commons registers against the views of the neoclassicists with respect to the scope of economic science relates to their handling of economic history. It is felt by Commons that the neoclassicists regard economic history primarily as a field in which analytical principles already developed may be tested for their applicability and not as a field in which new premises for economic science may be developed. Commons finds that the orthodox economist is too prone not to change his generalizations or his total framework of interpretation to fit the new facts of an ever changing historical situation. If the degree of conformity of analytical principles with historical facts is small, then the historical facts which do not fit their generalizations are excluded as irrational data by the neoclassicists. The attitude of the neoclassicist toward realistic studies is well explained by Lionel Robbins in his essay on the nature of economic science. In speaking of the business cycle—that "unexplained residue" of realistic facts not explained by pure theory—Robbins states:

> Here is a clear case where empirical studies bring us face to face with the insufficiencies of certain generalizations. And it is perhaps in the revelation of deficiencies of this kind that the main function of realistic studies in relation to theory consists. The theoretical economist who wishes to safeguard the implications of his theory must be continually "trying out," in the explanation of particular instances, the generalizations he has already achieved. It is in the examination of particular instances that lacunae in the structure of existing theory tend to be revealed.[18]

Thus, according to Robbins' interpretation, realistic studies are valuable mainly as an aid in filling the gaps or interstitial spaces of economic theory which have not been taken care of by deductive analysis alone.

Commons feels that historical and realistic studies of economic phenomena should be used for more than the mere discovery of lacunae in analytical generalizations. In his opinion these studies should be of great service in the re-examination of scientific generalizations and of the whole framework of interpretation of the economist. He believes that realistic studies have not been allowed to exert their full influence upon the thought structure of

[18] *Op. cit.*, p. 119.

the nineteenth-century economists. In his opinion the orthodox economist has become so wedded to the framework of interpretation created by Ricardo, J. S. Mill, Jevons, and Marshall that he refuses to accept the dictates of historical change. These dictates of historical evolution would require a revamping, and not a mere patching-up, of the inherited thought schema of economic science. With respect to the relations between realistic, historical studies and economic theory Commons finds himself in close agreement with Wesley C. Mitchell. The latter tells us in his survey of the development of economic thought from 1904 to 1929 that "in economics we are now passing through one of these periods when factual investigations are straining the framework that is supposed to contain them. . . . . Our current monographs contain within themselves not only the data, but also the tentative outlines, of the new generalizations that will reorganize the science for further work."[19] On the basis of the many monographs which he has produced in a lifetime of intensive research and close contact with economic problems, Commons feels that he is now prepared to indicate the broad outlines of a new framework of interpretation that would give full credit to the changes in the capitalistic system wrought by historical evolution since 1850.

IV. INSTITUTIONALISM AND ITS RELATION TO NORMATIVE ECONOMICS

As a historicocultural science, institutional economics is concerned not only with an understanding of particular historical epochs in the evolution of the economic system but it is also concerned with the general trends of each historical epoch in the development of the economic system. When analyzing the economic system in a certain historical epoch or situation, the institutional economist is analyzing "economic activity directed towards purposes in the future." Commons asserts that in the current historical stage of the development of capitalism social direction of economic activities is becoming increasingly important. Organized social intelligence is seeking to improve economic society by

[19] "Economics, 1904–1929," in his *The Backward Art of Spending Money* (New York, 1937), p. 409.

adopting the best prevailing economic practices to the end that human welfare may be extended as much as possible. These best prevailing economic practices are described by Commons as "ethical ideal types." The ethical ideal type is an economic arrangement or practice that actually exists and which can be investigated by the economist. It is to be found "in the practices of the best concerns that are able to survive in the then existing struggle for existence." Commons believes that his concept of the ethical ideal type is objective, because it is to be observed among the actual practices of progressive business enterprises. Furthermore, he feels that economists can be brought into agreement concerning these ethical ideal types. Where such agreement is secured, we have what is described by Commons as "consensual idealism" or "pragmatic idealism."

Institutional economics as conceived by Commons thus includes investigations which may be described as studies in normative economics. The normative aspect of institutional economics, however, relates not to the unattainable but to the attainable; and the attainable in Commons' analysis relates only to what is reasonable. Ethical ideal types are then only reasonable practices capable of attainment by business in general. They are defined by Commons to be "reasonable practices which are the highest attainable idealism or regard for the welfare of others that is found in going concerns under existing circumstances of all kinds, at a given historical stage of development."[20] In the course of social evolution society seeks to widen the application of the most ethical economic practices; and in Commons' opinion these practices are a proper object for the economist's consideration. He asserts that only a study of the ethically unattainable is unscientific because it is too subjective a matter for the scientist. Those distant ethical ideals, which may some day become a practice of the progressive minority among businessmen and eventually a practice of the great majority, are of no immediate concern to the economist, because they are still related to the subjective and

[20] Commons places much faith in administrative government as a device for establishing such reasonable practices (see his article "Twentieth Century Economics," *op. cit.*, pp. 34–41).

capricious feelings of individuals. They lack the necessary objectivity, cannot be investigated and tested as to their workability, and hence do not fall within the realm of scientific investigation. In speaking of attainable ethical ideals, as embodied in the best practices of progressive businessmen, Commons maintains that "if it is attainable, as shown by the best examples that survive, then a theory of the attainable is as much a scientific theory as is a theory of the attained." Hence, in Commons' view of the nature of economic science the problem of social idealism as expressed through collective action is as much a part of the subject matter of economics as any other aspect of collective action in control of individual action.

In adding the normative aspect to his historicocultural analysis of modern capitalism, Commons lines himself up with those economists who hold a functional view of their science.[21] Like the instrumental pragmatists among whom John Dewey is most outstanding, Commons is interested in more than a close view of the reality embodied in economic truths. Besides the discovery of economic truths, he is interested in molding these truths for the purpose of furthering the economic ends and aims of the community. The pragmatist determines the validity of a generalization or proposition by the nature of its consequences. If a principle "works," in the sense that the expected consequences follow upon the application of the principle, then it is taken to be valid. However, not all consequences are in conformity with a community's social purposes. There are many kinds of consequences—some good and some undesirable, some social and some antisocial. Not only is the pragmatist interested in ascertaining the consequences that flow from the application of a certain proposition, but he is also very greatly interested in selecting desirable consequences and avoiding those harmful to community interests. The desirability of consequences is determined by the consensus of opinion of those most competent to make such judgments; and competent opinion is taken to be the opinion of those best trained and suited

[21] Cf. A. B. Wolfe, "Functional Economics," in Rexford Guy Tugwell (ed.), *The Trend of Economics* (New York, 1924), pp. 445–82.

to make these judgments.[22] The measure of social and economic good is the consensus of opinion among social scientists and others with a thoroughly scientific attitude toward human conduct.

Commons' concept of reasonable value, which is the end-all of his normative economics, is similar to the pragmatist's concept of the social good. Commons offers no precise definition of the economic good. In his economic analysis the phrase is little more than tentative, since it points to economic ends that are still in the making. The philosophy underlying Commons' "volitional economics" is a form of social voluntarism. According to this social philosophy, the general social will expresses itself in a continuous series of choices supported by a consensus of competent opinion. Social voluntarism is leavened by the opinions of outstanding personalities which are in a position to influence not only other leaders in various walks of life but also the great masses of individuals.[23] The individual is checked in his economic choices by the social will, but upon society's economic ends and purposes there is no similar check. These ends are simply a development of what men on the whole and in the long run come to want by virtue of the nature of social evolution.

V. COMMONS' INSTITUTIONAL ECONOMICS AND RECENT TRENDS IN ECONOMIC THOUGHT

Commons' views on the scope of economic science may be summarized by stating that he would include within the field of economic science three different fields of interest, namely, analytical economics, historicocultural economics, and normative economics. The term "institutional economics" is used by Commons to in-

[22] For a critical analysis of the pragmatist's concepts of truth and the social good see H. G. Townsend, *Philosophical Ideas in the United States* (New York, 1934), pp. 233–46.

[23] It is at this point in his analysis that Commons unites individual action or personality and collective action. "The theory of reasonable value may be summarized, in its pragmatic application, as a theory of social progress by means of personality, controlled, liberated, and expanded by collective action. It is not individualism, it is institutionalized personality. . . . . It is fitted to a Malthusian concept of human nature . . . . ending in admiration for the individual who, by initiative, persistence, taking risks, and assuming obligations to others, rises to leadership" (*Institutional Economics*, p. 874).

clude both the historicocultural and the normative aspects of the science of economics. It is a field of investigation which Commons would add to the analytical economics of his nineteenth-century predecessors. The full title of his treatise on the nature and scope of economic science—*Institutional Economics: Its Place in Political Economy*—indicates that he never regarded his own work as other than an extension of the groundwork prepared by the nineteenth-century economists. It is this very extension of the groundwork of the classical and neoclassical economists that is the subject of so much debate. Neoclassical thinkers, such as those typified by Lionel Robbins, assert that the expansion of analytical economics to include historicocultural data carries the economist into a field where there is little or no uniformity of economic behavior that can be made the basis for worth-while scientific generalizations.[24] As soon as the economist gets away from price phenomena, he enters a field of data which may be of great concern to the sociologist and social philosopher but which is of little immediate interest to the economist as a scientist. Even those economists who accept the area of historicocultural data as a valid field for scientific investigation agree with Robbins that few useful generalizations have as yet been discovered in this field.[25] The majority of economists are therefore inclined to regard much of Commons' analysis as being more sociological than economic in its significance. They are unwilling to accept his broadening of the scope of economic science, since they are inclined to the view that he has not offered valid reasons for pushing back the boundaries of their science to the limits that he would like to see established.

In taking the fundamental fact of economic life to be its foundation in "customs and habitual assumptions," Commons appears to overemphasize the importance of customary behavior. There is a great deal of difference between saying that human con-

[24] Lionel Robbins has explored this whole question in his chapter entitled "Economic Generalizations and Reality" in his *An Essay on the Nature and Significance of Economic Science*, pp. 104–35.

[25] For an analysis of this whole question of the proper scope of economic science see F. H. Knight, "The Limitations of Scientific Method in Economics," in his *The Ethics of Competition* (1935), pp. 105–47.

duct has a heavy content of custom and habit which may seriously restrict the field of rational behavior and saying, as Commons does, that the underlying principle of human behavior is to be found in "customs and habitual assumptions." Although the majority of economists might be willing to concede the importance of custom and habit as significant elements in human conduct, they would be unwilling to accept Commons' assertion that custom and habit constitute the main point of departure in the investigation of economic life. While historically it may be true that human life has been slowly elevated above the frequently irrational levels of customary and habitual action, there does not appear to be sufficient reason for the assertion that the most basic fact of present-day economic activity is its customary basis. The weaknesses that develop in Commons' economics from his overemphasis of the importance of custom and habit are apparent. His abiding interest in the customary aspects of economic life brings him face to face with the irrational and unpredictable elements of economic activity. It may be the case that one cannot afford to ignore the irrational aspects of economic life if one is to secure a well-rounded interpretation of economic activity. However, this should not prevent one from realizing that there are some very definite scientific limitations on the handling of the kind of economic data that are of so much interest to Commons. These limitations explain why much of Commons' economic analysis does not go beyond the description of some particular cultural situation in which "customs and habitual assumptions" have a dominant rule.

It is not surprising that Commons' scientific generalizations have little in common with the economic propositions that have been worked out by present-day exponents of neoclassical thought. For the valuations of the market place, Commons substitutes the valuations of institutions, which give rise to "reasonable value." In his analysis:

> Reasonable value is not a valuation of commodities and services. It is a valuation of the transactions and concerted practises themselves by means of which ownership of commodities and services is valued and distributed among individuals and concerns. . . . . It does not lead to deductive or conclusive

> results . . . . all that the legal theory of reasonable value can do is to indicate possible lines of investigation. . . . . It is not deductive because it is not founded on the economists' presuppositions of self-interest and harmony of interests. It is founded on conflict, which is never logical. . . . . Reasonable value is pragmatic, not logical; it is action, not truth; justification, not justice.[26]

Commons' economic generalizations—such as the principles of working rules, sovereignty, and futurity—which he erects on the basis of his elusive and indefinite concept of institutional value, are necessarily more descriptive than analytical. It is possible to describe the kind of value that is of interest to Commons, but it is difficult to subject it to further scientific analysis. As a result, Commons' economic generalizations have little resemblance to the analytical principles that have been developed by the classical and neoclassical economists.

Since Commons wrote his first important institutional treatise, *Legal Foundations of Capitalism* (1924), the analytical principles of Marshallian economics have undergone considerable revision but not in the direction of Commons' analysis. The economics of monopolistic competition as presented by Edward Chamberlin in *The Theory of Monopolistic Competition* (1933) and Joan Robinson in *The Economics of Imperfect Competition* (1933) represents an endeavor to revise the framework of interpretation of orthodox economics along the same analytical path that was followed by Alfred Marshall. Commons is far from being satisfied with these recent trends of neoclassical thought, but, in branching out from the familiar paths of economic orthodoxy, he has failed to get beyond the loose-knit, historicorelative generalizations of cultural science.

Among economists there will probably be even less acceptance of Commons' views on the normative aspect of institutional economics. The weakest part of Commons' whole economic analysis is that portion of his work devoted to the treatment of the ethical problems of "reasonable value and reasonable practices." He has

[26] "Evaluating Institutions as a Factor in Economic Change," a lecture delivered before the graduate school of the United States Department of Agriculture, February–March, 1930, p. 18 (mimeographed).

done little to develop a precise definition of what he means by pragmatic ethics and the concept of the economic good. This defect in Commons' economic investigations may be attributed in large part to his empirical bias. His empiricism, which is the main philosophical doctrine nourishing his economic analysis, leads him to avoid final goals and ultimate principles. As a result, his interest is primarily in fact-gathering and experimentation. In his effort to avoid the pitfalls of that intellectualism which he takes to be the fundamental weakness of nineteenth-century economics, he swings to the other extreme. Like other pragmatists he feels more at home in the world of experience than in the realm of analytical principles. But especially the pragmatist must have some ends and aims in the light of which fact-gathering and experimentation take on meaning and significance. Commons has written a great deal about general economic welfare and industrial good will, but as yet he has not worked out very thoroughly the philosophical arguments for his proposal to include normative economics within the scope of economic analysis. While it is impossible to divorce completely the social sciences from ethical analysis, since social science data are replete with references to human purpose, it does appear desirable in some circumstances to draw a line between the work of the scientist and that of the ethicist. The canons or standards of scientific analysis and those of ethical judgment exhibit some fundamental differences, which Commons has not worked out thoroughly in his economic analysis. What these differences are and what their significance is, are questions to which Commons could very well devote more analysis. One may go further with the remark that the whole question of the relations between economic science and ethics is in need of further investigation by Commons.

Discussions relating to the methodology and scope of economic science have a quality of breaking out periodically with renewed vitality only to subside eventually as various issues are subjected to the bright light of close reasoning. Perhaps economists will come to settle the many important issues raised by Commons' views on the nature and scope of economic science, not by saying that political economy should include analytical, historicocultural,

and normative economics but by agreeing that it is desirable that economists should have some adequate knowledge of the cultural and ethical aspects of their economic investigations. The value of Commons' views on economic science would then appear to lie in the fact that they once more call attention to the theoretical limitations of analytical or neoclassical economics as a scientific discipline. This is so because his views focus attention upon the various kinds of significant problems that are left outside the pale of analytical economics. Commons' analysis directs attention to the fact that all economic reality is not to be comprehended by the purely scientific point of view and that the final reality for which men strive is compounded from scientific analysis, social philosophy, and ethical considerations. It seems that the course of contemporary social and political events is showing the desirability of having economists who are willing to give some deep thought to the cultural and ethical implications of scientific economic investigations. When this is done, the economist's scientific findings will come to have a much closer contact with the pressing problems of human conflict. However, a broadening of the economist's social interests does not necessarily mean that the scope of economics should be similarly expanded. It may be desirable to stress the pragmatic values of economic theorizing without foregoing the many obvious advantages of that specialization in the economist's scientific efforts with which Commons appears to have such little intellectual sympathy.

SENIORITY IN MASS-PRODUCTION INDUSTRIES[1]

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SENIORITY is preference in available employment opportunities based upon length of service. Seniority systems grew up on the railroads over fifty years ago in an atmosphere of precarious tenure of employment marked by various forms of favoritism, nepotism, and job-selling. As long as the carriers were free to make layoffs and promotions according to merit or ability, they thereby retained the power to "play favorites" and to discriminate against union members. Consequently, the railroad unions sought to limit discretionary control by the carriers by forcing them to make layoffs and promotions in accordance with a clear-cut and definite formula based on length of service. By thus limiting management's power to differentiate between employees on the grounds of merit the unions were in a stronger position to control employment policies. The desire for protection of older workers, as such, appears to have been secondary.

The depression years of the 1930's turned the attention of industrial workers from a search for opportunity to a quest for security. In the face of widespread unemployment, brought about by curtailed production and intensified by technological changes, employees in the mass-production industries desired above all job protection. Consequently, the leaders of the new unions pressed for the acceptance of seniority rules as a means of demonstrating to the workers that organization would provide job protection and security of employment. The appeal was well timed, for many employers in the manufacturing industries that were

[1] The analysis of seniority set forth in this article is based largely on personal interviews with employers and labor officials. These interviews were made by the writer in 1939 and 1940 while in the employ of the Industrial Relations Section of Princeton University. A detailed compilation of the material collected is to be published by that organization in the near future.

hit by the depression had been laying off workers in a haphazard and not unbiased fashion.

Before 1935 seniority rules had been common in only a few unionized industries, such as railroads, printing, and street and interurban transportation. As a result of organization by the C.I.O. in hitherto nonunion fields, however, seniority systems have been established more recently in the steel, oil, automobile, glass, electrical equipment, radio, rubber, and other manufacturing industries. But, in transplanting seniority systems that had developed in traditional union fields, such as railroads and printing, to the new environment of mass-production industries, many serious problems have become apparent. The greater seasonal fluctuations in employment, the lack of clear-cut occupational groups, and the relative instability of the "districts" (i.e., occupational groups, departments, or plants) in which seniority is applied in the latter industries make the application of such systems more difficult. Furthermore, these problems become more pressing in the case of industrial unions which comprise groups of workers whose interests may be diverse. Many leaders of the so-called "vertical" unions have found in the seniority issue a "headache" for which there is no ready remedy.

CONDITIONS NECESSARY FOR THE SMOOTH OPERATION OF A SENIORITY SYSTEM

Seniority has been most common in those industries in which changes in employment are neither frequent nor violent and in which most layoffs are occasioned by prolonged periods of business recession or by the permanent curtailment of production.[2] Railroad employees and street-railway workers have been outstanding advocates of seniority. Their employment, in the short run at least, has been relatively stable. Of the newly organized industries, seniority has apparently worked most smoothly in petroleum refining—an industry in which employment fluctuates very slightly.

On the other hand, the Amalgamated Clothing Workers and

[2] For further discussion of this point see Sumner H. Slichter, "Layoff Policy," *Addresses on Industrial Relations, 1939* ("Bureau of Industrial Relations Publications," No. 9 [Ann Arbor: University of Michigan]), pp. 75–77.

the International Ladies' Garment Workers favor work sharing during periods of slack production rather than layoffs on the basis of length of service. If seniority prevailed in the clothing trades, which are subject to sharp seasonal fluctuations of employment, the long-service workers would have steady work while the short-service employees would bear the entire burden of unemployment. The latter group might find their annual incomes reduced below the subsistence level, and their need might drive them to accept employment under conditions which would undermine the labor standards established by the union. Consequently, equal division of work is preferred to seniority as a means of preserving the unity and solidarity of the union.

In the mass-production industries, which may be subject both to seasonal as well as to prolonged periods of slack employment, some groups of employees may favor work sharing while others may prefer layoffs on the basis of seniority. Short-service employees naturally desire some system of work sharing, while the longer-service workers may press for the layoff of junior employees so that there will be more work available for the senior men. The age distribution of the union membership, consequently, has an important bearing on the method that will be emphasized.

Combinations of seniority and work-sharing systems are quite common in manufacturing industries. If slack periods are relatively short, work sharing is generally feasible, since it is usually not costly to the employer and since the average income of the permanent workers may not be curtailed substantially. Both men and management, therefore, may agree to keep the working force intact during such periods. However, if the slack period turns into a prolonged recession, there is more objection to work sharing. The employer may find it inefficient to rotate work among a large number of employees, particularly if operations are continuous.[3] Likewise, the long-service workmen, who find their customary standard of living undermined by reduced earnings, are likely to object to "sharing the starvation" with newly hired em-

[3] In the case of noncontinuous operations, the entire force may work two or three days and the plant may be shut down for the rest of the week. If operations are continuous, however, it is necessary to "stagger" working schedules and to rotate shifts. Carried to extremes, this system may become very costly.

ployees. Thus many agreements provide that, in the event of indefinite curtailment of production, the work week shall be reduced to the point where regular employees have twenty-four or thirty-two hours' work per week.[4] If further curtailment is then necessary, layoffs are made in accordance with seniority. In this way a compromise is reached in an attempt to satisfy groups with conflicting interests.

A seniority system is seldom feasible unless the employing establishments are relatively stable and long-lived. In accumulating seniority rights a worker may become virtually "married" to a particular seniority district, whether it be a company, plant, department, or occupational group. In the ladies' garment industry, seniority rights accumulated with individual employers would be practically valueless, since large numbers of workers are forced to seek new employment at frequent intervals as manufacturers and jobbers go out of business or reorganize.[5] On the other hand, seniority has been applied on the railroads with the expectancy that seniority districts are reasonably permanent and that the employer will continue in business for a relatively long time.

Although the mortality rate of large industrial enterprises may not be much greater than that of railroad corporations, the seniority districts are likely to be less permanent. Seniority is seldom applied on a company-wide basis. It is sometimes applied on a plant-wide basis, but more frequently its scope is limited to a single department or even a particular occupational group. Yet in modern industry jobs, departments, or even entire plants may be eliminated as a result of technological improvements. For example, the development of continuous rolling mills in the steel in-

[4] The existence of W.P.A. employment and of unemployment insurance has tended to establish a "floor" to work sharing. When working hours are reduced below thirty per week, employees in the lower wage groups may find that they are better able to subsist on work relief or insurance benefits than on the meager income from regular employment.

[5] In the New York dress industry, for example, about 20 per cent of the manufacturers and jobbers and about 33 per cent of the contractors who were in business at the beginning of the year have discontinued by the end of the year. (Information supplied to the writer by the International Ladies' Garment Workers Union.)

dustry has rendered obsolete scores of sheet and bar mills. The constant changes and shifts in the markets for industrial products, furthermore, may divert business from one firm to another, or, in the case of a large diversified concern, from one division or department to another. Technological and market changes, therefore, may make the seniority districts in mass-production industries very unstable. The problems created thereby are best illustrated by a concrete case.

A large concern in the automotive industry had seven plants. A great deal of the work performed in the various plants was similar; in other words, workers could be and had been transferred from plant to plant. Because of the loss of a particular line of business, the company found it necessary to lay off most of the working force in plant No. 7, where by chance there was an unusually large number of long-service workers, some of whom had been transferred in past years from the other plants. As soon as the workers in the other six plants became aware of the impending force reduction in plant No. 7, they insisted that seniority be applied strictly on a plant basis. Under this scheme, of course, the workers laid off from plant No. 7 would have no seniority rights in the other plants and therefore could not displace the shorter-service workers in these plants. By applying seniority on a plant instead of a company-wide basis, therefore, the employed workers in the six plants were able to erect a "seniority barrier" against long-service employees displaced from plant No. 7 who otherwise would be able to claim their jobs. The workers from plant No. 7, who were members of the same local union as the other employees, naturally protested. After a bitter controversy that almost wrecked the union, they were voted down. The result was that many men from plant No. 7 with ten and fifteen years' seniority were on the streets while other employees with four and five years' service remained at work in the other plants. As competing companies in the same industry had seniority rules also, the displaced workers had slight chance of re-employment, and even if they were to find jobs, they would have to start at the bottom of the seniority list as new employees.

The same problem may arise within a single plant where seniority is applied on a departmental basis. The permanent elimination of jobs in one department (as a result, let us say, of a technological improvement) will cause the displaced workers to demand some sort of plant-wide seniority, at the same time creating pressure from workers in the other departments for limitation of the scope of seniority to departments or occupational groups. Many agreements provide that seniority will become plant wide when jobs or departments are permanently eliminated. Yet, whenever large numbers of workers are so displaced, sharp controversies are likely to develop, which in many cases may divide the union into two warring camps. It is true that controversies of this nature have arisen on the railroads over the question of "point" versus "division" seniority. Such disputes, however, seem to have been less frequent and less violent than those in the newly organized mass-production industries, where the pace of technological advance is quicker and the shifting of markets more pronounced.

Generally speaking, seniority systems work most smoothly in those companies where there are clearly defined crafts or occupational groups within which jobs are of a similar nature and between which jobs are naturally noninterchangeable. In railroad shops, for example, machinists, blacksmiths, electricians, and so forth have seniority within their respective crafts. Because of the similarity of work, occupational fitness may be determined with relative ease and precision, and there is very little movement of workers from one craft or occupation to another.

On the other hand, in a large manufacturing concern there is likely to be a great diversity of jobs. In the steel industry, for example, there are hundreds of different occupations requiring a wide variety of skills. For purposes of accounting, administration, and supervision industrial plants are commonly divided into departments. If there is a reasonable degree of similarity of operations within its limits, the department may be the logical seniority district. Frequently, however, one department may be working at full capacity while others are relatively slack. Thus, it is not uncommon for short-service employees to be working in one part of

the plant while long-service employees are laid off from another. In most factories, furthermore, some occupations cut across department lines. Thus crane operators, truckmen, and common laborers may be employed on similar work in several different departments throughout the plant. Consequently, there may be a demand for the "leveling up" of layoffs between departments among certain groups of workers. The infinite variety of combinations of plant and department seniority found in the new union agreements is an indication of the complexities that may arise in the determination of the proper seniority district.

In order to afford long-service workers the maximum job security, the union may want to broaden the scope of the seniority district. The United Electrical, Radio, and Machine Workers Union apparently favors some sort of plant-wide seniority applied by similar or interchangeable occupational groups. A few union officers have insisted on some form of company-wide seniority, and one has indicated to the writer that eventually some sort of industry-wide seniority would have to be applied if job security were to be made proportional to length of service. The employer, on the other hand, usually wants to restrict the seniority district in order to avoid excessive movement or cumbersome transfers and "bumping." The smaller the seniority district, the easier it is to determine the fitness and ability of employees to perform the work available. Since there is often a sharp difference of interest between the company and the union on this score, a compromise is usually necessary.

On the other hand, the pressure for the restriction of the seniority district may come from the workers themselves. Employees of a particular occupational group or department may attempt to build "seniority walls" around themselves to prevent an influx of longer-service workers from other parts of the plant. It is safe to conclude, therefore, that the probable result of a seniority system in any large manufacturing plant will be to "compartmentalize" employees by restricting their movement from one district to another. At the same time the movement of workers from plant to plant and company to company may be rigidly circumscribed.

As long as workers engaged in similar occupations are employed

in different seniority districts, there is always the possibility of a clash of interests among the employees involved if seniority is applied on a strict and rigid basis. Yet the great diversity of jobs, together with the organizational and technological complexities involved, make it almost impossible to regroup departments so as to make them desirable units from the standpoint of the application of seniority. The system on the railroads, it should be recalled, is simplified to the extent that seniority districts coincide with rather clear-cut occupational groups. This has been facilitated, of course, by collective bargaining along craft rather than industrial lines.

THE CONSEQUENCES OF A SENIORITY SYSTEM

The most obvious effect of a seniority system is to restrict the movement of long-service workers from one seniority district to another. In so far as the seniority districts remain stable, older workers with long-service records become immobilized. At the same time younger workers who have little or no seniority become increasingly mobile because the burden of job insecurity is shifted to their shoulders. Over a period of time the average age of those employed will increase because of the decreased turnover of long-service workers. Consequently, when new employees are required, employers will probably prefer to hire younger workers to infuse "new blood" into an aging working force. Thus the demand for new workers may be focused upon a mobile reserve of younger men. Yet, if technological changes and market shifts tend to make the seniority districts unstable, the displaced long-service workers who were previously "married" to such districts may find it very difficult to secure new jobs because the employers will want to avoid hiring middle-aged and older workers. In such cases the "compartmentalization" that follows from widespread application of seniority results in automatic discrimination against long-service workers who have the misfortune to be displaced from their regular jobs.

Older working forces will create pressure for the retirement of workers at an early age. Both employers and unionists are agreed that some provision should be made to retire superannuated work-

ers in order to afford opportunity for the advancement of younger employees. Many union leaders and not a few employers are already convinced that the social security laws should be liberalized so as to provide for the pensioning of workers at age sixty instead of sixty-five.

The effect of a seniority system on industrial efficiency is difficult to ascertain. Seniority is nearly always applied with some reference, either stated or implied, to skill and ability. The more rigid systems make length of service the governing factor in layoffs and promotions if skill and ability are *sufficient* for the work to be performed. On the whole, employers would prefer to make seniority the determining factor only among employees of *equal* merit or competence.

Many employers have complained that seniority discriminates against the highly skilled and most competent workmen, dampens the initiative and incentive of younger employees, and results in stagnation and impaired efficiency of the working force as a whole. But such arguments are based on the assumption that the employer has measured precisely the relative skill and ability of workers and will differentiate between them on that basis alone. Yet the inability or neglect of management to develop fair and objective means of determining relative competency in the past is in part responsible for the current demand of organized labor for seniority rules. The distinction between superior ability on the one hand and discrimination, favoritism, or nepotism on the other is often hard to draw. Therefore, in so far as a seniority system displaces a haphazard system of layoffs and promotions based only on intangible personal judgments, industrial efficiency need not be impaired—but, on the contrary, might conceivably be increased.

A substantial number of employers agree that the layoff and re-employment of workers in accordance with the general principle of seniority is not inconsistent with good personnel management. Skill and ability may be correlated with length of service in the case of a large majority of workmen. In the case of promotion, nevertheless, the senior employee is less frequently the one who has the requisite qualifications for advancement. It appears,

however, that the danger to working-force efficiency springs not from the general adherence to the seniority principle but rather from its too strict or rigid application in the case of a minority of employees who possess unusual skill and ability. Were it possible to retain or promote such employees regardless of seniority, the main objections of the employers might be met. The problem of fair and objective determination of ability, however, would still remain. Available evidence indicates that unbiased measurement of skill and ability may be facilitated when made with the cooperation of, and in some cases the actual participation of, union officials.[6]

Under good management, a seniority system that is sufficiently flexible to allow exemptions of exceptional workers may not dampen incentive or destroy initiative. It calls, however, for more careful selection and training of new employees, the establishment of definite production standards, and the discharge or transfer during times of normal operations of those workers who fail to meet such standards. It is true that the older working force may be a disadvantage in those industries that require youthful energy and vigor. Yet, on the whole, the lack of "young blood" may be offset by the lower turnover, longer experience, and greater loyalty of an older and more permanent working force. It is difficult to find actual cases which show that a seniority system, as such, has seriously impaired the standards of industrial efficiency.

In the mass-production industries it appears that seniority may be more troublesome to the unions than to the employers. The difficulty of establishing seniority districts and the instability of such districts in the face of technological and market changes have

[6] Many manufacturing companies have introduced "employee ability rating" schemes in order to measure more precisely the relative merits of workers. Although still dependent on personal judgments, these schemes are objective in the sense that several management representatives check the ratings of each employee according to definitely prescribed criteria, such as quantity and quality of work, initiative, versatility, physical fitness, and other factors. If such rating plans are initiated and developed solely by management *after* an agreement has been signed outlining a seniority system, unions are likely to look upon them as devices used by management to circumvent seniority and thereby to retain unilateral control over layoffs and promotions. In those cases where the union has had some part in the formulation of the plans, however, there has been very little opposition.

already been pointed out. In accumulating seniority the workers build up vested interests and individual rights. In most cases seniority rights may give the long-service worker greater security of employment if he is fortunate enough to be working in a seniority district where employment is stable or expanding. Yet, seniority does not create jobs; it merely allocates employment opportunities among different groups of workers. Thus, an employee is likely to look upon his seniority as a means of exclusion of fellow-workers from existing jobs. Workers of a particular craft may soon find that they can preserve some relatively favorable employment conditions by building a seniority wall around themselves to prevent an influx of "outsiders." If the average length of service of the workers in such a group is relatively short, there is all the more reason to use the seniority system to exclude long-service workers from other parts of the plant.

The effects of the creation of individual rights and group exclusiveness within an industrial union are obvious. Workers may become accustomed to look to individual seniority rights rather than to the union for job protection. The conflicting interests of workers with short- and long-service records in different seniority districts may result in factionalism and disunity within local unions. For example, the officers of one local union in a Detroit automobile plant have found it necessary to ban the discussion of seniority in general meetings because of the fights that have developed among the members. In short, seniority can become a disruptive force in an industrial union which may undermine the unity and solidarity of the organization. It may intensify the struggle between the craft-minded workers on the one hand and the general plant working force on the other.

Union leaders in the mass-production industries appear to be increasingly aware of the inherent dangers of a very strict seniority system. Many unionists maintain that there would be little need for rigid seniority rules if the employers would grant the union shop. In large measure, seniority is adopted as a defensive device during the period of insecure recognition of the union. The demand for rigid rules and regulations springs in part from an inferiority complex, or sense of weakness, in dealing with manage-

ment. With proper recognition, a strong union may be able to serve the interests of the membership better by building up effective grievance machinery to check favoritism, bias, or discrimination where they may exist. It is quite possible, therefore, that seniority systems in the mass-production industries may be modified substantially as unions are accorded more complete acceptance, particularly if they share with management some responsibility for the determination and measurement of skill and ability.[7]

CONCLUSION

It has been shown that the application of a seniority system is far more difficult in the case of mass-production industries than in the case of the railroads. Employment in the manufacturing industries is often subject to greater fluctuations. Seniority districts are more difficult to establish, and they are likely to be unstable. Whereas seniority may be a unifying force in the case of the craft unions on the railroads, it may generate conflict and dissension within vertical unions in manufacturing industries.

It is to the interest of many employers and unions to abolish rigid seniority rules and regulations in favor of some more flexible system. The employer desires some method whereby workers who possess unusual skill or exceptional ability may be retained or promoted without regard to seniority. In the long run, organized labor also will be better off if workers look to the union, rather than to individual seniority rights, for job protection. Both management and labor, therefore, may prefer a flexible system which might give considerable weight to the seniority principle but which would avoid the building-up of definite or absolute seniority rights. In the end, both desire a fair and non-discriminatory method of selection of workers for layoffs and promotions.

In this respect, a rather unique scheme for handling layoffs and re-employment has been worked out in a large electrical manu-

[7] It is true that rigid seniority rules have persisted on the railroads and in the printing industry in spite of complete acceptance of the union by many employers. Yet, for the reasons already mentioned, seniority is more difficult to apply in the mass-production industries because of the complexities involved in establishing seniority districts. The unions in these industries, therefore, would have greater incentive to experiment with some objective method of determining skill and ability as a means of avoiding the pitfalls of too rigid seniority rules.

facturing plant. Both the company and the union have agreed that, although seniority should be followed as a general principle, no rigid rules shall apply. Cards bearing the names of each worker, his length of service, and the occupations for which he is qualified are arranged on boards in order of seniority by departments. These boards are placed in a small office to which both union and management representatives have free access at all times. When a reduction of the working force is necessary, management makes a tentative selection of the workers to be laid off. Then, the case of each individual worker is discussed in order of least seniority, as indicated by the position of his card on the board. By mutual agreement between the company and the union, employees who possess special skill and ability or who are deemed incompetent to perform the work available may be retained or laid off regardless of seniority. It is understood, however, that the case of every employee must be considered or discussed in order of length of service. In rehiring a similar procedure is followed. If jobs are permanently eliminated as a result of changes in methods or equipment, the seniority status of the displaced workers is a matter for negotiation. Both union and management representatives attribute the successful operation of the scheme to the procedure of discussing facts pertinent to concrete individual cases rather than attempting to formulate rules to apply generally throughout the plant.

In order to secure the necessary flexibility in seniority systems, more emphasis must be placed on the administration of principles set forth in agreements rather than the legislation of detailed rules in contracts. In this respect, constructive and co-operative union-management relations are essential. As long as employers and unions regard labor contracts as defensive barriers rather than instruments to promote closer relationships, rigid rules and strict regulations are likely to be emphasized. On the other hand, where employers have been willing to relinquish complete unilateral control of employment policies by talking over all proposed reductions in hours, layoffs, and promotions with the union *before taking action*, union officers have been less inclined to seek protection through the enforcement of rigid seniority rules. Furthermore, if union leaders are consulted on the determination of

skill and ability, they are less likely to demand the abolition of the merit system. In other words, the union has little to fear from any merit system as long as it has some check on the determination of skill and ability. The fundamental issue is not seniority versus ability but rather unilateral versus bilateral control of employment policies. According to this theory, therefore, the prevalence of rigid seniority rules in many contracts in the mass-production industries is largely the result of suspicion and distrust which grows out of the employer's desire to defend "management prerogatives" and the union's struggle for more secure recognition status. In other words, the problems of the status and rights of each party have been obstacles standing in the way of a factual approach to the fundamental issues through the process of collective bargaining.

The experience of the railroads has shown, however, that once rigid seniority systems are accepted by the employer, they tend to become rooted in employment policies and to be accepted by both sides in spite of the development of more constructive union-management relations as time goes on. The danger of rigid seniority rules, which grow up as defensive measures during the period of organization, is that they may become more detailed and all-inclusive as workers acquire vested interests on the basis of these rules. In the end, therefore, employment policies may lie beyond the control of both management and labor. Union-employer relations may then become dependent on laws or formulas rather than on the more flexible process of collective determination.

It is likely that many seniority rules in the mass-production industries may have to be modified as production is increased to meet the requirements of national defense. Existing seniority barriers are bound to restrict the movement of skilled workers from nonessential industries to those that are more vital to the national defense program. Thus, the present state of emergency may force employers and unions to devise more flexible seniority systems. It is probable, furthermore, that necessary readjustments may be more easily effected as worker interest swings back from concern for security to a search for greater opportunity as business conditions improve.

THE NOVELS OF THOMAS DELONEY AS SOURCE FOR "CLIMATE OF OPINION" IN SIXTEENTH-CENTURY ECONOMIC HISTORY

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ECONOMIC historians have known for a long time of the pamphlet-novels of Thomas Deloney, a London silk-weaver of the late sixteenth century, but they have made little use of them. Miss Frances Consitt's edition of the records of the London Weavers' Company down to 1600 makes it clear that Deloney's work contains disguised comments on the changes in economic organization that were taking place in his time, and comparison of contemporary records with his pamphlet-novels suggests that Deloney described his own activities through elaborate and often obscure literary devices. It appears that Deloney advocated consistently the Tudor "very and true commonweal" theory of society as his general social ideal. It will be possible here only to establish the authenticity of one leading incident in the pamphlet-novels and to suggest leads in other directions; but even this will make plain the wider value of these writings, particularly in the difficult matter of opinion on minute and obscure issues.[1]

The incident in which Deloney himself was involved occurred in 1595 and was of fundamental importance in the effort of English weavers in London to maintain their stated and customary

[1] See Frances Consitt, *The London Weavers' Company* (Oxford: Clarendon Press, 1933); Deloney, *Works*, ed. F. O. Mann (Oxford: Clarendon Press, 1932); J. W. Allen, *A History of Political Thought in the Sixteenth Century* (London: Methuen & Co., 1928), pp. 134–57, presents a discussion of the "commonweal" theory. For comments on Deloney's *Jack of Newbury* see A. P. Usher, *Industrial History of England* (Boston: Houghton Mifflin Co., 1920), p. 223, and E. Lipson, *History of the Woolen and Worsted Industries* (London: A. & C. Black, 1921), pp. 46–47, 51, 67, and 246. For Deloney's literary position see Ernest A. Baker, *History of the English Novel*, II (London: H. F. and A. Witherby, 1937), 170 ff., and Abel Chenalley, *Thomas Deloney* (Paris: Librairie Gallimard, 1926). For general information as to Deloney's life, see the editor's introduction to the *Works*.

rights against the competition of aliens who, though they worked in defiance of the local regulations, were tolerated by the officers of the London Weavers' Company. In general, the question was this: Could a craftsman be deprived of his customary craft rights without legal remedy of some sort, even though the officers having jurisdiction in these rights failed to act when called upon for defense and remedy? The craft's customs had been recognized by royal charter in 1155, and the problems of their defense had faced the weavers since the time of Edward III.[2]

In the sixteenth century the problem was complicated by the growth of a strong oligarchy within the weavers' company, which could exercise or neglect jurisdiction in the small craftsman's rights almost at its own pleasure. Alien weaving was tolerated by this ruling group in 1568, and an extensive new charter, in 1577, which gave the company a genuine position in Tudor economic government, failed to make much change. The small craftsmen had to protect themselves. They tried to do this by forming, at first under company supervision, committees to carry out the neglected ordinances which should have protected them. Their powers were limited, however, and they had to seek the intervention of city authorities. But without company help this brought very little relief from the alien groups, which were well organized under the French and Dutch Calvinist church systems in London and various other English towns.[3]

By 1595 the small craftsmen finally felt it necessary to take extra-legal action in defense of their explicit legal rights. The first step was the issuance of a pamphlet stating their grievances. Other steps followed in quick succession, bringing Deloney with several others to jail and involving them in a desperate social and

[2] Consitt, *op. cit.*, chaps. i–v, has told the story; the sources involved are on pp. 180–226; Henry II's charter is on pp. 180–81 with a translation. This, says Miss Consitt, contains the basic set of ideas for all later royal charters of craft guilds (p. 3).

[3] *Ibid.*, chaps. vi and vii, give the information on which this paragraph is based. For Tudor charters and records, see pp. 223–321. On the French churches in England, see William Page, *Letters of Denization and Acts of Naturalization for Aliens in England, 1509–1603* ("Huguenot Society Publications," Vol. VIII) (London, 1893), pp. xxviii–xxxii.

political crisis which filled London with riots and now enlisted the close attention of Lord Burghley. The crisis finally ended with a suspension of civil rights and a reign of martial law.[4] As Professor Cheyney has shown, all England was suffering. The Tudor commonwealth, held together mainly by an aged queen and many bewildering and conflicting "ancient laws," was threatened from without by a Spanish and French encirclement and from within by Catholic and Protestant nobles and gentlemen who were beginning to feel that the mantle of "sovereignty" could repose justly only on their own shoulders. Deloney's plea, in defense of the declining "commonweal," was a feeble one and must have come at a very inopportune time.[5]

Beginning with the first week of June, 1595, Burghley had kept close to the situation in a disorderly and riot-ridden London, apparently seeking for the meaning within each overt act and writing a memorandum of these events on the twentieth. On June 6 he noted that a London silk-weaver came to the lord mayor's house,

> using some hard speeches against the Lord Mayor in dispraise of his government. The Lord Mayor said he was mad and so committed him to Bedlam as a madman, but not then having his officers about him sent him towards Bedlam by some of his own servants; and without Bishopgate he was rescued by prentices and divers others to the number of about 200 or 300 persons.[6]

This is our first indication of the parallel between Deloney, the actual course of events, and his apparent version of them in the pamphlet-novel *Jack of Newbury*. Deloney himself was a silk-weaver and may be the "madman" of Burghley's account. Later

[4] Miss Consitt has told part of the story, *op. cit.*, pp. 143 ff. The pamphlet and other records appear in appendixes 21 and 22, pp. 311 ff. Burghley's interest is recorded in *Hatfield MSS, 17th Report of the Historical Manuscripts Commission*, V, 248 ff. The martial-law commission is given in G. W. Prothero, *Select Statutes and Other Constitutional Documents Illustrative of the Reigns of Elizabeth and James I* (4th ed.; Oxford: Clarendon Press, 1913), pp. 443–44. Privy council records are missing for this period.

[5] E. P. Cheyney, *A History of England from the Defeat of the Armada to the Death of Elizabeth* (2 vols.; New York: Longmans, Green & Co., 1926), II, 3–107. *The Calendar of State Papers Domestic* for the period offers ample background evidence in accessible form.

[6] *Hatfield MSS*, ... , V, 249.

in the same month he was also in trouble with the lord mayor of London, Sir John Spencer, who was then a leading Levant merchant, and representative of all that a small, independent craftsman like Deloney abhorred.[7] The story in Deloney's *Jack of Newbury* may well relate to Spencer.[8]

On June 12 Burghley notes "the disorder for the fish, the whipping, the proclamation,"[9] and on the thirteenth, "disorder for the butter." On the fifteenth another arrest and apprentice rescue, accompanied by hard words against Spencer, was the opening signal for a series of attacks and counterattacks between London authorities and apprentices. One of the apprentice attacks, according to the lord treasurer, was brought about because of the "hard usage" shown by a master; to this the abused prentice's brother retaliated and "broke the master's head," precipitating a general brawl. Sir Richard Martin and Sir John Hart, who had been involved in the weavers' troubles, attempted with varying success to preserve order but could not stop the trouble until Sir Richard gathered a considerable company to back him up. The day's hostilities ceased, according to Burghley, with Spencer's sending a man to the counter for refusing to doff his cap to the lord mayor.[10]

In Burghley's eyes this was a mere preliminary, for during the next two or three days "certain soldiers" met the prentices and masterless men at St. Paul's and told them, "You know not your own strength." The prentices asked the soldiers to join the prentice cause, and the soldiers consented, all agreeing to meet the next day. Burghley feared that a full-fledged armed rebellion was on the verge of breaking out. He had had the story from a boy and sent him back to St. Paul's to hear more.

[7] For definite identification of Deloney as a silk-weaver, see my "Thomas Deloney: Two Notes," *Modern Language Notes*, LII (February, 1936), 103 ff. For Spencer, see the *Dictionary of National Biography*, and for Deloney's probable attitude toward merchants, aside from what will be seen here, see his *Works*, pp. 109–15, his version of the rise of Simon Eyre.

[8] See below, p. 873.

[9] This proclamation is not in Robert Steele's *Bibliotheca Lindesiana* (Oxford: Clarendon Press, 1910).

[10] *Hatfield MSS*, ... , V, 249.

Here on June 20 Burghley's memorandum ends with a six-point program for redress of the situation, which is so similar to a royal proclamation of martial law on July 4 that it is undoubtedly the basis for it. Most significant of all in connection with the weavers' difficulties, as will now be seen, is Burghley's final note in the memorandum charging Sir John Spencer with most of the blame: "The Mayor charged with (1) insatiable avarice, (2) selling and converting offices to his own gain, (3) suffering these officers to be negligent, (4) refusing to bear or join with his brethren."[11]

Sometime between June 20 and June 27 Burghley sent to the suspected lord mayor requiring "to be further advertised touching the printing of a pamphlet by the Company of Weavers," according to Sir John Spencer's reply to this request. Sir John wrote the lord treasurer that the pamphlet was printed by one Gabriell Sympson, and the proof was first read at the house of "one Muggens" before the "whole number of weavers," who agreed to print forty copies, thirty to be delivered to Dutch and French churches, though twelve "shewed their mislike," and one apiece to the aldermen and mayor. The "principall men that have bin doers in this busyness are one Willington, Muggins and Delonye, whereof Willington was the chiefe devisor." All were then in Newgate prison on the mayor's orders.[12]

Strype, in his edition of Stowe's history of London, gives the following account, which may well be the story of this pamphlet's circulation:

> In the year 1595, Sir John Spencer, Maior, wrote to the Lord Treasurer in the Month of June, "That that Morning coming from the Ordinary Place of the meeting of him and his Brethren, in St. *Paul's* Church before Sermon, at the Steps, a Libel (a copy, whereof, *literatim*, was enclosed) was delivered unto him by one of Sir *Richard Martin's* Servants, who told him, that it was that Morning found under the said Sir *Richard's* door. . . . . In this Libel he, the Lord Maior, was reproached, and the said Alderman, in whose house it was found, commended.[13]

[11] *Ibid.*, pp. 249–50. (See p. 3, n. 2, for reference to the martial-law proclamation.)

[12] Consitt, *op. cit.*, p. 318.

[13] *Survey of London*, ed. John Strype (London, 1720), Vol. II, Book V, p. 333.

On "Monday morning," according to Sir John, the weavers, seeing their "foul practice" discovered, tried to alter the pamphlet, but to no avail. All available copies were destroyed, and it is preserved only because copied into the weavers' records, whence Miss Consitt prints it.[14]

A defense of the silk-weaving members of the London company, this version is addressed to the ministers and elders of the French church in London. Though they are aliens, it says, they have been welcomed "even as Members of the misticall body of Jesus Christ, and Citizens with us of that heavenly and celestiall kingdome."[15] But many seek only "their owne private Lucre," without regard for "the liberties and privileges graunted to the Freemen of this honorable Cittye, to the great and amazing endamaginge of the Comon wealth and to the utter spoile and begerrie of the Queenes leige people."[16] Four specific protests are made: against violation of the limits set (in the company's recent charter) to the number of looms each may have; against teaching fellow-aliens the trade of silk-weaving without regard to the English rules; against women weavers who marry out of the craft and bring in their husbands; and against teaching the craft to masters.[17] The whole is directed only against the aliens; but, as Miss Consitt points out at length,[18] the governors of the company had generally favored the aliens. Thus the pamphlet is actually directed at the company's rulers, who, after all, had control of the industry under the new charter.

Here the course of events becomes clear enough to trace the allegorical account of them, which Deloney seems to have presented in his *Jack of Newbury*. This version is offered as fictionalized history and purports to be a chronicle of the protest of all the clothier-employers of England against the action of Cardinal Wolsey in stopping cloth exports to the Low Countries in the 1520's. But it begins by pointing out that, owing to this stoppage of trade, the clothiers have

[14] *Op. cit.*, p. 318.

[15] *Ibid.*, p. 312.

[16] *Ibid.*, p. 313.

[17] *Ibid.*, pp. 313–14.

[18] *Ibid.*, pp. 127 ff.

sought to ease themselves by abating the poore workemens wages. And when that did prevaile, they turnd away many of their people, Weauers, Shearmen, Spinsters and Carders, so that where there was a hundred Looms kept in one town, there was a scant fifty: and he that kept twenty put downe tenne. Many a poore man (for want of worke) was hereby undone, with his wife and children, and it made many a poore widow to sit with a hungry belly.[19]

In short, it is the plight, not of the clothier-employer, but the situation of the unemployed and the wage-earning weaver that primarily interests Deloney here, just as in his conflict with the London aliens. This similarity of interest becomes surer when we note an almost literal parallel to the above passage in the pamphlet sent to the aliens. Just as the novel's clothiers cause misery by cutting wages, by competitive labor, the aliens also,

like the envyous man . . . . care not to picke out their owne eyes that their neighbor might lose both his. And by this meanes many a poore Englishman is quite undone with his wife and poore Children, and brought to such miserye as is lamentable to be rehearsed.[20]

Most interesting in the *Jack of Newbury* account is the method by which the English clothiers were to be organized by Jack to remedy the situation, something which is missing from the direct records. He decides to write a letter to all the clothiers of England and enlist their joint aid in petitioning the king. For, Jack wrote in the letter:

I found that nothing was more needfull herein, than a faithful vnity among ourselues. This sore necessity can no way be cured but by concord. . . . . Deare friends, consider that our Trade will maintaine vs, if wee will vphold it.[21]

He exhorts them to assemble in each town and take a weekly collection, for noblemen's secretaries and lawyers have slow tongues and deaf ears "which must bee daily noynted with the sweete oyle of Angells." From each local assembly representatives are to come to London and present their petition; all told, Jack wrote to 60,600 clothiers, according to Deloney.[22]

A hundred and twelve gathered and were heard by the king,

[19] *Works*, p. 43.

[20] Consitt, *op. cit.*, p. 314.

[21] Deloney, *Works*, pp. 43–44.

[22] *Ibid.*, p. 44.

who said they were among his "best Common-wealths men" and commanded that the petition be granted. Jack was to represent the clothiers in the negotiations, but he at once ran afoul of the great cardinal on whom all had to attend while the business was hanging fire. Delays followed, finally angering Jack into announcing that if the cardinal's butcher-father had been as slow killing calves as Wolsey was at dispatching poor men's suits, the king's great counsellor would not have worn a miter now. At this the cardinal, like the lord mayor, cast Jack and his fellow-clothiers, like Deloney, Muggins, and Willington, into prison.

Returning now to the actual conflict of June, 1595, in London, Deloney, Muggins, and others imprisoned with them petitioned Sir John Popham, chief justice of England, against Sir John Spencer's action, stating their case and asking release. They pointed out that they had petitioned former London mayors and aldermen successfully in 1589 and 1594[23] about the violations of the company's rules by the aliens and were merely trying to get their legal rights in printing the pamphlet. The resort to a public appeal by the small silk men, the petition went on, was the result of "mere necessitye," since the small men could get no further action on their appeals against the aliens.[24]

Sir John Popham's reply and grant of the petition, as it was copied into the weavers' records, finds that the plight of the petitioners was in fact due to

> the negligence or oversight of some former Governors or Masters of the said Company, in admittinge Sundry Alyen Straungers into their Societye, and allowing them such privileges and number of Apprentices as by the provisions and Ordynaunces of their Guyld have not been sufferred or permitted amonge the Freemen of the said Company.[25]

[23] Consitt, *op. cit.*, p. 311, for these petitions and orders.

[24] *Ibid.*, pp. 316–17, for the full petition.

[25] *Ibid.*, p. 317. A short search at the Public Record Office failed to turn up the original of this. The confusion of the time is reflected in the state of the records. It is important that the circumstances surrounding this reply are known, for, as Eli F. Heckscher points out in *Mercantilism* (2 vols.; London, 1935), I, 269–70, the attitudes of Tudor and Stuart courts play a great part in the industrial regulation of the times but are themselves based on "purely legal and popular conceptions," matters so obscure and difficult, he says, that there is little hope of ever understanding them.

The July martial-law proclamation was thus apparently not intended as a repressive measure against the pamphleteers. But a final settlement in 1596 left them still in the hands of the city courts.[26]

The rest of Deloney's parallel story in *Jack of Newbury* tells of Jack and his fellows lying in jail for four days, with the cardinal preventing a petition they addressed to the king from reaching its destination. But the Duke of Somerset was a good man, according to Deloney's tale, and hearing of the neglected petition, he remonstrated with the cardinal. The cardinal was stubborn and felt that Jack must be a Lutheran heretic, because no one but a Lutheran could have recalled the great man's low birth; nevertheless he would release the clothiers from prison, and he sent for them in order to forgive their trespasses "as Steuen forgave his enemies that stoned him." Furthermore, Jack's petition was granted, and there was much rejoicing.[27]

Here we see, perhaps, the events that intervened between the actual imprisonment of Deloney and his companions and the granting of the petition, events whose connection is now suggested for us by the last of the three contemporary points of view we have examined: Burghley's, Spencer's, and now Deloney's. Spencer, like Wolsey, it appears, attempted to interpose himself between the weavers and the central government on which the weavers placed their hopes. But the guardian of the commonweal was too vigilant in this instance, and Burghley, like Somerset, intervened and got the facts as they really were, not as they were distorted by the lord mayor, like the cardinal. In the end the central government completely overturned the plainly manufactured charge of sedition, and possibly insanity, against Deloney, just as the charge of "Lutheran heresy" was dismissed in Jack's case. In spite of the confusion of a general political crisis, a major economic shift, and a great religious conflict, the actual lines of relationship seem to present themselves here quite plausibly, even where deliberately misleading evidence has been left to us. This was no obscure conflict of irrational and aimless wills;

[26] Consitt, *op. cit.*, p. 318.

[27] *Works*, p. 46.

it was a business-like attempt by a capitalistic merchant to suppress craft rights which the central government explicitly wanted preserved.[28]

In general, the theory which, I believe, informs all the pamphlet-novels, the notion of the "very and true commonweal," is concisely stated in a speech by Henry I to the clothiers of Halifax in Deloney's *Thomas of Reading*, a pamphlet-novel single mindedly devoted to asserting the weavers' customary rights. The passage runs thus:

> The gouernors of a Common-wealth ought to obserue two speciall precepts: one is, that they so maintain the profit of the Commons, that whatsoeuer in their calling they doe, they referre it thereunto: the other, that they be alwaies as well carefull ouer the whole Common-wealth, as ouer any part thereof; lest while they vphold the one, the other be brought to vtter decay.[29]

The idea will be familiar to all readers of sixteenth-century social treatises.[30]

For the first half of the next century these pamphlets give, to what Lipson calls "the revolt of the handicraft element," a clarity difficult to match.[31] Reprinted frequently throughout that period

[28] If the reader is alarmed at what may seem a high-handed series of readings, it should be remembered that we are dealing in sixteenth-century literary aesthetics, a different proposition from the later realism. The reader was supposed to exercise his ingenuity, according to known rules, in extracting the various meanings intended by the author. On this see H. H. Glunz, *Die Literarästhetick des europaïschen Mittelalters* (Leipzig, 1937), especially pp. 360–61. Also J. M. Berdan, *Early Tudor Poetry, 1485–1547* (New York, 1920).

[29] *Works*, p. 226.

[30] See Cunningham's essay, "Early Writings on Politics and Economics," *Cambridge History of English Literature*, IV, 339 ff.; also Allen, *op. cit.;* R. H. Tawney, *Religion and the Rise of Capitalism* (London: John Murray, 1926), pp. 166–67; C. H. McIlwain, *The High Court of Parliament and Its Supremacy* (New Haven, 1910), p. 349; Conyers Read, "Mercantilism: The Old English Pattern of a Controlled Economy," *The Constitution Reconsidered* (New York: Columbia University Press, 1939), pp. 68–69; John U. Nef, "English and French Industrial History after 1540 in Relation to the Constitution," *The Constitution Reconsidered*, pp. 85 ff.

[31] *Economic History of England* (3 vols.; London: A. & C. Black, 1931, 1937), III, 333 ff. As Lipson shows here, the London weavers continued to have a turbulent time within the company down through the Civil War.

and far into the eighteenth century, they were in great demand.[32] Read by contemporaries faced with the problems to be seen in Deloney's tales, they continued to show that the small craftsman had a very definite sense of his place in the community and very little fear in asserting it. For, after all, as Chief Justice Popham indicated, the most oligarchic corporate officer could not deprive a craftsman of his legal rights without suffering an appeal to the highest law and gubernatorial office in the commonwealth.[33]

[32] I have collected from various sources a list of over twenty editions of Deloney's novels in the seventeenth century alone.

[33] For the legal and constitutional basis of my general view I am indebted to the studies of George Unwin, supported by S. B. Chrimes' *English Constitutional Ideas in the Fifteenth Century* (Cambridge [England]: At the University Press, 1936), especially on the meaning and scope of statute, ordinance, common law, canon law, law merchant, and various types of royal acts; see especially, "The Effective Scope of Statutes," pp. 264–89. In general, see D. L. Keir, *Constitutional History of Modern Britain, 1485–1937* (London: A. & C. Black, 1938), pp. 45–46. For the statutory basis of Popham's jurisdiction, see J. R. Tanner, *Tudor Constitutional Documents, 1485–1603* (Cambridge [England]: At the University Press, 1930), p. 7 (St. 19 Henry VII, c. 7).

A STATISTICAL STUDY OF THE NEW YORK GENERAL INCORPORATION ACT OF 1811

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THE New York "Act Relative to Incorporations for Manufacturing Purposes"[1] is well known as the earliest attempt in the United States to bring about general incorporation, at least for certain specified manufacturing industries. The original law provided for the incorporation of firms in the textile, glass, metal, and paint industries.[2] Capitalization was limited to $100,000, and existence was restricted to twenty years. Proxy voting was permitted and, in contrast to many of the special incorporation acts passed up to that time, voting was on the modern basis of one vote per share with no limitations such as maximum voting power or graduated voting. The maximum number of directors (called "trustees" in the act) was nine. In the years following 1811 the law was extended to a few other industries, and in 1821 it was renewed for the last time.

Scholars working in the field of the history of business organization have been inclined to attach little importance to this act, pointing out that its terms were relatively unattractive (low maximum capitalization and short life) and that few charters were issued and these lasted only a brief period of time.[3] Therefore, it is concluded that the 1811 act was hardly more than a halting, short step toward general incorporation and that the more liberal special-act charters were preferred. More attention is paid to the general incorporation acts which were introduced in many of the states in the 1830's and 1840's.

[1] *Laws of 1811* (approved March 22), c. 67.

[2] Specifically, it applied to the following products: woolen, cotton and linen goods, glass, bar iron, anchors, mill irons, steel, nail rods, hoop iron and iron mongery, sheet copper, sheet lead, shot, white lead, red lead, clay and earthenware articles (after 1815), and leather (after 1817 but only in a limited number of counties).

[3] Cf. S. Livermore, *Early American Land Companies* (New York, 1939), pp. 261–62, and A. Berle and G. Means, *The Modern Corporation and Private Property* (New York, 1934), p. 136; also S. Livermore, "Unlimited Liability in Early American Corporations," *Journal of Political Economy*, October, 1935.

This writer feels that such opinions of the 1811 law have perhaps been formed without a full knowledge of all the facts. A study of the articles of incorporation on file at the office of the secretary of state at Albany revealed that many companies were formed under the act and led to the conclusion that it was far more important than has heretofore been believed. This study was limited to the number and the provisions of the original charters, although it may be possible through a painstaking search of other records at Albany to find out how many of these companies actually went into operation and how many were dissolved before 1848 (the year of the more modern general incorporation act).

It can be seen from Table 1 that in the period from 1811 to 1848 a total of 362 charters were issued under this act. To be sure, a much greater number (1220) of companies were created by the more usual procedure of incorporation through a special act, but this total includes public utilities (turnpikes, ferries, bridges, etc.), mining, banking, insurance, and railroad companies as well as manufacturing companies. In fact, only 150 manufacturing companies were incorporated by special acts during these years, with a total nominal capitalization of $24,473,000, compared with the $23,163,100 nominal capital of the companies of the general act.

The first year saw the birth of 11 corporations and the high point of 39 companies for the whole period was soon reached in 1814. Most of these were textile mills, so that it is obvious that the activity in this brief period was at least partly due to the cessation of imports of cottons and woolens brought about by the War of 1812. If the legislators wished to aid "war babies" by means of this law, they must have been quite satisfied with the results. A similar increase in charters under special acts took place in 1811, when 13 of the 43 companies were manufacturing concerns, and most of these were also textile mills. The general act was more popular, however, since there was a sharp decline in the number of charters granted to companies by special act during the war years and until the revival of the 1820's. One can see from Table 1 that a similar decrease of incorporations took place after the war under the 1811 law. Probably the flood of English textiles following the war and the accompanying general business depression had much to do with these fluctuations. The next peak came in the speculative years of 1836 and 1837, and the "bursting" of this famous "bubble" is vividly illustrated in the great decline of incorporations after these years. A third and last peak occurred in 1846 followed by a decline to the end of the period. The most popular

TABLE 1

NUMBER OF MANUFACTURING COMPANIES INCORPORATED UNDER NEW YORK GENERAL AND SPECIAL ACTS (1811–48)

	General Act					Special Act
Year	Total	Textiles	Metals	Glass	Mixed & Misc.	Mfg. Cos.
1811	11	6	2	1	2	13
1812	12	10	1	.....	1	5
1813	29	25	3	1	.....	4
1814	39	33	3	1	2	4
1815	19	17	2	.....	.....	1
1816	8	6	2	.....	.....	1
1817	5	2	1	.....	2	.....
1818	4	4	.....	.....	.....	1
1819	1	1	.....	.....	.....	.....
1820	1	1	.....	.....	.....	.....
1821	3	1	.....	.....	2	.....
1822	3	2	.....	.....	1	1
1823	6	4	2	.....	.....	1
1824	2	1	.....	.....	1	1
1825	10	2	2	.....	6	9
1826	10	2	5	.....	3	7
1827	9	5	3	.....	1	.....
1828	9	3	3	1	2	9
1829	9	8	.....	.....	1	1
1830	2	.....	.....	.....	2	4
1831	8	5	2	.....	1	4
1832	3	2	1	.....	.....	14
1833	6	3	1	1	1	7
1834	10	5	2	2	1	9
1835	13	3	5	1	4	7
1836	20	10	3	1	6	15
1837	17	6	6	.....	5	7
1838	4	1	.....	1	2	7
1839	4	1	1	.....	2	8
1840	5	2	1	2	.....	2
1841	12	6	1	.....	5	4
1842	3	3	.....	.....	.....	.....
1843	.....	.....	.....	.....	.....	1
1844	13	9	1	2	1	.....
1845	12	4	4	1	3	2
1846	24	20	3	.....	1	1
1847	13	11	2	.....	.....	.....
1848	3	2	.....	.....	1	.....
Totals	362	226	62	15	59	150

years for charters under special acts were also the 1836–37 boom years. The decline in both cases seems to refute one reason generally given for the coming of general incorporation in 1848, namely: congestion in the legislature due to the increasing number of applications for incorporation by special act. But, on the other hand, the decline might have been caused by anticipation of the 1848 act in that projects were postponed until passage of that law.

It has already been stated that the 1811 act applied only to a limited number of manufacturing industries, although for all practical purposes these were probably the most important in the United States at the time. Table 1 shows that of these industries the most popular among the corporations were the textiles—cotton, woolen, and linen—with a few companies producing silk and hemp products. Such companies were 226 in number, or more than half of the total. Companies in the metal industries stood at second place with 62 and included those producing the following articles—iron bars, nails, textile machinery, copper and lead, steam engines, steamboats, capstans, pins, screws, etc. Miscellaneous and mixed firms accounted for 59 companies which produced leather, salt, porcelain and earthenware, bricks, cement conduits and tombs, paint, beer, musical instruments, marble, etc. Some of these "mixed" companies were authorized to produce a number of products, including textiles, but in most cases the objectives were quite narrowly limited. Finally, the smallest group (15) was made up of the glass companies.

Some of the financial details of these companies are of interest. It was mentioned above that the maximum capitalization permitted was $100,000 and the question arises: Was this relatively low figure a serious handicap to incorporation under the act? A glance at the nominal capitalization of companies chartered by special act reveals that not a few of these firms also had a capitalization no greater than the $100,000 of the general law. For example, taking a few of the most active years, the writer has found that in 1811, 6 of the 13 manufacturing charters granted were for capitals of $100,000 or less; in 1825, 5 of the 9 companies were of this size; and in 1832, 9 of the 16 companies were no larger. These smaller companies for the most part were in the industries favored by the general act—textiles, paint, and glass. Companies with a higher capitalization were chiefly in the metal and sugar refining industries, and these are the companies which account for the higher total capitalization of companies created by special act (cf. above, p. 878). Furthermore, if the twenty-year limitation to the lifetime of the 1811 charter is to be considered a handicap, it must be

stated that most of the special-act companies suffered under the same limitation of life.

Some further light on the effects of capitalization limitation are shown in the number of companies which were capitalized under the general act up to the maximum permitted. Inspection of each of the 362 charters has shown that only 155 were of $100,000 capitalization, while 167 of the remainder were capitalized at $50,000 or less. If $100,000 had been considered too low by the promoters of those days, one would expect that they would at least have taken advantage of the opportunity to capitalize to the limit.

One of the clauses of the 1811 act required incorporators to state the location of the company, and the information so acquired gives further light on the development of manufacturing in the state. It is not surprising to find that the counties in and adjoining New York City contained the largest number of corporations chartered under the general act. New York, Kings, Queens, and Westchester counties all together harbored 71 of these companies (New York alone had 51). But the next highest was upstate Oneida County with 43 and third highest was New York City's neighbor, Dutchess (21). Despite its leading position, the New York area began to show an interest in manufacturing companies incorporated under state charter only after the War of 1812, perhaps because of the rapid growth of the city's population, wealth, and trade, especially after 1815. Although textile firms were fairly numerous in the city, New York was stronger in the metal industries than the other counties. On the other hand, the rest of the state was better represented in the textile field. It was not unusual in the days of water power that a large number of the textile mills should be located by the sides of rivers and streams in small, almost unknown villages of Oneida, Otsego, Madison, and Chenango counties. Toward the end of the period a few "steam mill" corporations made their appearance and probably inaugurated a movement in the industry away from the rural areas and toward the city.

Rensselaer County was the seat of twenty firms mainly interested in metal goods and textiles while the northern and Adirondack counties of Jefferson, Essex, and Herkimer naturally inclined toward iron-smelting and manufacturing. The western counties on the whole were poorly represented.

Many of the charters contained information on the stock holdings at the time of application for incorporation, and one gains the impression that there was a fair amount of concentration of holdings

among a few people—primarily officers and directors—and that the stockholders were local residents. Since the companies were small, this tendency probably continued throughout the life of the corporations, although at the same time it must be admitted that it would only be natural for a newly incorporated firm to exhibit these characteristics.

Finally, it may be interesting to present some information on the par value of the stock of these companies. Perhaps a high par value might have tended to discourage distribution of the stock and even to make the law unpopular among promoters. Nothing existed in the act to the effect that a certain value should be attached to each share. The use of no-par stock was, of course, not resorted to by these companies. A par value of $100 was adopted by the largest group (165 companies) and only 64 used a higher value. Of the latter only 19 adopted par values in excess of $1,000, and all of these were in the metal and glass industries. Seventy-two used $50 par values and 39 went as low as $25. The lowest par value was $5, which was adopted by only two corporations. There appears to have been a slight tendency toward par values of less than $100 after 1830 but it was not marked nor widespread. Under the special acts par values of $50 and $100 seem to have been most popular, although higher values were not unknown.

It is the belief of the writer that the General Act of 1811 was a more important stage in the development of general incorporation than has generally been supposed. For the period as a whole, it was a far more popular method of incorporation for manufacturing purposes than the better-known special acts. Its companies were smaller on the average but more numerous. The popularity of the law was not limited to the wartime years when American substitutes for foreign imports were especially desired; large numbers of charters (large at least for the times and in comparison to the special-act procedure) were granted down to the last years of the period despite the supposed handicaps of low capitalization and limited life. The Act of 1848[4] continued in existence companies which had been previously incorporated. Although this act did not contain the limitations on the objectives and capitalization which were found in the 1811 act and was a more vigorous step toward the modern ideal of general incorporation, the old General Act of 1811 certainly seems to have played an important part in the economic and legal history of the state.

[4] *Laws of 1848* (passed February 17), c. 40.

PRICE FLEXIBILITY AND CONCENTRATION IN THE AGRICULTURAL PROCESSING INDUSTRIES[1]

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IN THE August issue of this *Journal*,[2] Mr. Backman saw fit to criticize that part of my analysis of the cheese industry which dealt with cheese prices.[3] It is not my wish to engage in a controversy on the question of price "flexibility" with one who has devoted so much more attention to this problem than have I.[4] Yet I do feel called upon to state briefly the extent of both my agreement and my disagreement with Mr. Backman's remarks.

I

First, I quite agree with Nourse and Drury's statement, which Backman quotes with approval, that "frequency of change . . . . [is] a fictitious and misleading test of the soundness of price adjustment"—at least, when taken alone and by itself. Of course, amplitude of change may be equally important.[5] It was for this reason, among others, that I presented Figure 1 of my article, showing actual week-to-week changes in cheese prices during 1936–38, furnishing the fuel for the coals heaped upon my head by a critic I had hoped thereby to allay.[6]

[1] This article will be filed as Journal Paper No. J-805 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 595.

[2] Jules Backman, "Flexibility of Cheese Prices," *Journal of Political Economy*, XLVIII (1940), 579–82.

[3] "Post-war Concentration in the Cheese Industry," *Journal of Political Economy*, XLVII (1939), 823–45; esp. pp. 834–37.

[4] Jules Backman, *Price Flexibility and Inflexibility* ("Law and Business Series, Contemporary Law Pamphlets," Ser. 4, No. 3 [New York: New York University, 1940]).

[5] Although, as Backman admits, "frequency of change has been shown to have a high degree of correlation with amplitude of change" ("Flexibility of Cheese Prices," *op. cit.*, p. 579). Incidentally, the average standard deviations of weekly prices from the annual mean, for the same three-year periods shown in Fig. 2, showed a similar decline: 3.4, 3.0, 1.7, 1.2, 1.1, 1.2, and 1.4, respectively.

[6] Fig. 1 would have been much more effective if the data for the three years had been plotted consecutively rather than superimposed, since the longest period of unchanged price (twenty-four weeks) fell within two different years (1936–37).

In the text accompanying Figure 1, I stated that "considerable stability is apparent." By "stability" I meant an infrequency of price change much greater than similar cheese prices had exhibited in earlier years of the period examined and relative to the much greater frequency of change customarily found in the prices of agricultural products. With the benefit of hindsight, I see that my mistake was my terminological substitution in subsequent sentences of the term "inflexibility" for "stability." At that time, I was unaware that "*frequency* of price change" had acquired a place in our scientific terminology as "volatility," while "flexibility" is confined to "*amplitude* of price change."[7] I must, therefore, plead guilty to a loose use of the terms "flexible" and "inflexible," with the hope that, for once, ignorance of the "law" is a good excuse, while heartily applauding the distinction thus made. Hence, I am quite willing that Mr. Backman (and others) substitute the terms "volatility" and "involatility" (?) for "flexibility" and "inflexibility" wherever I misused them in my original article.

II

As a result of this confession, Mr. Backman might be quite willing to withdraw his charges. Since my chances for further rebuttal are doubtless exceedingly small, however, the counsel for the defense would surely urge me not to exhibit overconfidence in the plaintiff's tenderness of heart. I must, therefore, consider his fear that my article "be cited as a case study supporting the widely held belief that price inflexibility is largely due to concentration of control." Agreeing with him that the exploitation of this particular relationship has long since passed the point of diminishing returns, I join him in saying "Heaven forbid!"—at least on the basis of my superficial consideration of this phase of my investigation.[8]

However, my conclusion that "there appears to be a *prima facie* inference that this marked and growing stability of prices—*in light of the conditions under which they are established*—has not reflected

[7] *Handbook of Accepted Economics: Consensus of Opinion of the Committee on Economic Accord*, p. 17, as referred to in Backman's brochure, *Price Flexibility and Inflexibility*, p. 4.

[8] In the process of summarizing a much longer piece of work (William H. Nicholls, *Post-war Developments in the Marketing of Cheese* [Iowa Agric. Exper. Sta. Res. Bull. 261, 100 pp.]) into this article, I now see that the price section bulks much larger in the abridged edition than its importance in the original bulletin would probably warrant.

comparable stability in supply and demand conditions"[9] might lead to that interpretation by others as well as Backman. What I meant to suggest was that, in combination with the questionable procedure by which quotations on the cheese exchange are established and the increasing concentration of buying power, the concomitant decline in volatility of cheese prices over a twenty-year period may well be a symptom of oligopsonistic price behavior. In support of this view, I refer my critic back to the statement by a leader in the cheese industry, Mr. Kraft, which I quoted in my original article.[10] I therefore merely wished to indicate that, in my opinion, further investigation of this question appears warranted.[11]

So far I have concerned myself with purely terminological questions. Once these are disposed of, Backman's specific criticisms fall to the ground, since I did not concern myself with "flexibility" (as he defines it) at all. But a more fundamental problem remains.

III

It seems to me that Backman's concept of "cyclical flexibility" could shed little light on the question of concentration of control in the cheese industry, even if price flexibility and concentration were closely related in the "manufacturing" industries. This follows, since he fails to recognize the peculiar category into which agricultural products (as opposed to "manufactured" products) fall.[12] Unlike ordinary manufacturers, the processor-distributors of any given agricultural product (such as milk used for cheese) do not have any important degree of short-run control over their volume of operations, since they are "obliged" (for a consideration, of course) to process and distribute whatever volume of product thousands of farmers decide to produce and (after considerable time) offer for sale. The natural reaction (exploited in meat-packer publicity, for example) is that, since there is

[9] "Post-war Concentration in the Cheese Industry," *op. cit.*, p. 837, with italics added.

[10] *Ibid.*, pp. 838–39.

[11] I explicitly acknowledged that I had made no attempt to measure such effects in my investigation (*ibid.*, p. 841) but pointed out the need for such an analysis.

[12] At the same time, I freely admit that the analysis which follows represents a clarification of my own thinking which, by inference at least, lays that part of my own article in question open to attack upon somewhat similar grounds. I am indebted to Backman's criticisms for their catalytic effect in crystallizing the ideas presented below.

no control over the supply (hence none over price), there can be no monopoly.

But such an argument is obviously fallacious. The "supply" subject to short-run control in such industries is surely that of processing-distributing services, not the supply of the unprocessed product or (except through storage) its derivatives. Hence, "control" in such industries means "margin" control in the short run. As far as the relationship to concentration of control is concerned, therefore, it is the flexibility of the margin between the prices of the unprocessed product and the processed product (or between the buying price and selling price), which is relevant, not the flexibility of either of these prices taken separately. Thus, the wholesale (selling) price of cheese might fluctuate willy-nilly with changing short-run supplies of milk, and yet—if competition among the processor-distributors were such as to permit the maintenance of relatively inflexible margins—the full effects of these fluctuations would be passed back to producers in the form of similarly flexible buying prices, as any agricultural economist knows they tend to do. Hence, concentration of control might be reflected in inflexibility of margins, even though prices were highly flexible.[13]

I attribute my own failure (and probably that of others) to see this more clearly in previous writings to my preoccupation with long-run analysis. In long-run analysis, since inputs (and outputs) are conceived of as virtually an unchanging flow through time, it is not ordinarily necessary to distinguish between present and future prices. Therefore, control of the supply of processing-distributing services and control of the supply of inputs and outputs (hence, of buying and selling prices, and their difference—the margin) become one and the same thing. This follows since any departures of price from such a long-run "equilibrium" are assumed to call forth continuous and instantaneous supply or demand responses, so that the margin is but the difference between instantaneously determined buying and selling prices. But, in short-run analysis of the agricultural industries, in particular, one must recognize that, due to the relative discontinuities in farmers' production response to price, current buying prices are related to production

[13] The decreasing volatility of bulk cheese (buying) prices previously noted may have reflected the increasing importance of processed cheese (the resale prices of which were maintained oligopolistically by the large distributors) relative to cheese sold in bulk (at more flexible prices) in the selling market. The B.L.S. wholesale cheese prices used by Backman cover only the more flexibly-priced bulk cheese.

at some future date, not to current supplies.[14] Hence, the farmer does not have to be paid the price at any given time which he expected to receive when his decisions on present production were made. The burden of short-run "surpluses" may, therefore, be laid squarely upon the farmer.

IV

Since Backman fails to perceive this fundamental short-run difference between the agricultural processing-distributing industries (where production control is typically impossible) and the general manufacturing industries (where cyclical production control is a major form of adjustment), his remarks about the cyclical flexibility of cheese prices are irrelevant to the question of concentration in the cheese industry. Thus, he found that, during 1937–38, cheese prices declined 40 per cent as compared "with a decline of slightly more than 10 per cent in the Bureau of Labor Statistics wholesale price index in the same period." Since this index is his criterion of flexibility, he concludes that cheese prices are flexible. But it is only natural that the price of a product in relatively uncontrolled short-run supply (with a marked seasonal movement as well) will have a greater amplitude of change than the prices of steel rails, jackknives, rubber tires, and hundreds of other manufactured products included in the index for which short-run

[14] This type of confusion is fostered by the fact that, in traditional economic theory, transition problems, in so far as they have been brought in at all, were dealt with by the rather clumsy expedient of distinguishing between "long-run" and "short-run" equilibrium. While the recent developments in dynamic theory by Hart, Hicks, Lindahl, and others offer in many ways a more realistic approach to the problem of short-run fluctuations, they are, as yet at least, in such a pioneer stage as to be of little direct aid in empirical research.

Nevertheless, their contributions lead me to expect that there is probably not any close relationship even between flexibility of margins and concentration of control in the agricultural industries. Rather, I feel that it can be demonstrated that, given imperfect competition among processor-distributors, the greater the degree of *uncertainty* by processors as to farmers' future supply response to price (including the vagaries of nature) and as to future demand, the greater the probability that margins will be relatively constant. To the extent that concentration of control leads to more adequate research and planning staffs on the part of the dominant firms, by which such uncertainties are at least minimized, margins may become *more* flexible in order to influence the direction, if not magnitude, of future changes in supply. Nevertheless, uncertainty appears to be the more important factor in determining flexibility of margins rather than the particular form which imperfections of competition take.

control of production is possible.[15] The same shortcoming would appear partially to invalidate his consideration of "concentration of control" in his monograph on price inflexibility, where he includes cured beef, bacon, ham, and cheese in his list of products having both flexible prices and a high degree of concentration of control.[16]

We may conclude that Backman's measure of cyclical flexibility could cast little light on the question of concentration of control in those industries engaged in the processing and distribution of agricultural products. For here flexibility of margins is the relevant if complex problem and his criterion is, to say the least, heterogeneous.

[15] It is true that Mr. Backman has considered the relationship between price inflexibility and production changes elsewhere (*Price Flexibility and Inflexibility*, pp. 27–31) but found (p. 30) only a "slight tendency for inflexibly priced products to be accompanied by greater decreases in production than those whose prices were more responsive to the impact of outside forces." But nowhere does he separate out agricultural products and manufactured products from his conglomerate of data (264 commodities)—a distinction which appears fundamental to the present writer.

[16] *Ibid.*, pp. 32–33. However, his analysis does indicate a wide variation in price flexibility even among manufactured products, and of these classifies a surprisingly large number as having "flexible" prices. But does this not result from the use of an all-commodity "average" as a criterion (p. 11) plus a relatively narrow definition of inflexibility and a liberal definition of flexibility (p. 12)?

BOOK REVIEWS

Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process, Vols. I and II. By JOSEPH A. SCHUMPETER. New York: McGraw-Hill Book Co., Inc., 1939. Vol. I: Pp. xvi+448; Vol. II: Pp. ix+647. $10.00 for set.

What is more important: the making or the testing of hypotheses? Professor Schumpeter has made a major contribution to both these branches of economics, with equal enthusiasm and industry, with equal perspicacity, and with equal sense of measure. Students of his earlier work find its main results again, but refined and enriched.

"Innovation is the outstanding fact in the economic history of capitalist society or in what is purely economic in that history" (p. 86). "Innovation" is defined as any change of the production function, i.e., of "the way in which quantity of product varies if quantities of factors vary." This change is, however, mere "invention," not "innovation," as long as no entrepreneur has applied the new device in actual practice; and this implies borrowing from a bank, or some other form of "credit creation," "the monetary complement of innovation" (p. 111). Innovation may extend beyond the field of production or distribution technique in the narrow sense: e.g., "Dr. Jameson's attempt to innovate by means of a raid" on the Boers (1896) in support of the policies of the diamond and gold mining interests (p. 381). On the other hand, credit creation does not by itself constitute innovation, and "the trouble with John Law was not that he created means of payment *in vacuo*, but that he used them for purposes which failed to succeed" (p. 114).

But if technical progress (in the widest sense) is always coupled with money creation, does this fact in itself explain the rhythmic pattern of the change, all the turning-points of the cycles? It does not, in Professor Schumpeter's "first approximation," his "two-phase cycle" (disturbance of and return to an equilibrium); but it does, or may, explain all the turning-points in the "second approximation," which includes at least one further hypothesis not contained in the first. The first approximation, as the present reviewer understands it, may be illustrated by the solid line of Figure 1, showing the changes through time of one of the economic variables, money income. New borrowing

occurs at A, to introduce new methods; the borrowing entrepreneurs bid for production factors; wage and interest rates and prices rise; and prices fall again when the new output, produced at lower real costs per unit than the old one, comes on the market, and the loans are repaid.

This seems to be the gist of the first approximation. Professor Schumpeter shows why the impact given by a single innovation cannot lead to an indefinite expansion: limits are set by increasing costs, in particular by the uncertainty increasing more and more as one de-

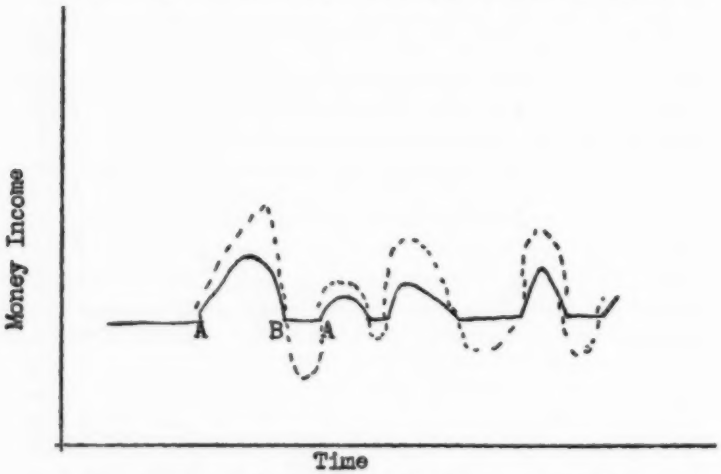

FIG. 1.—Solid line, first approximation; dotted line, second approximation

parts further from the old settled situation. This does not preclude, however, the path of, say, the money income from being a horizontal line—if innovations follow one another in such a way that the effects of the new money creation are exactly offset by repayments of the old loans, or, in other words, the bullish effect of new construction demand is offset by the bearish effect of the supply of newly produced goods. A continuous and uniform stream of innovations would result in no business cycles, and Schumpeter's first approximation does not show why the innovations should not occur continuously and uniformly. It is the second approximation (indicated by the dotted line on Fig. 1) which makes the periodicity a possible, though still not a necessary, feature of the system. "Many people act on the assumption that the rates of change they observe will continue indefinitely, and enter into

transactions which will result in losses as soon as facts fail to verify that assumption" (p. 145). Thus, in terms of Figure 1, the fact that the slope of the money-income curve (or, for that matter, of the price curve) is negative at *B* would make for a further reduction of borrowings, or an increase of repayments certainly not on the part of all but at least of some producers, thus driving money income below the *status quo* level. The element of speculation is thus introduced in Schumpeter's second approximation. He is aware, we think, of the fact that this additional assumption, while explaining the exaggerations of the downswing, does not establish the necessity of a turning-point: "Though it may thus be shown that a restorative tendency will develop to work against the spiral" [the author has in mind the 'vicious spiral of depression'] there is nothing to prove that it will prevail against it" (p. 154). The second approximation makes the system determinate; whether it also does or does not make its solutions periodical depends on the concrete values of the magnitudes involved, e.g., on the responsiveness of borrowers to price trends, the type of repayment time schedules, the lags involved (duration of production), the character of inventions, etc.

We shall try to express what seems to be the gist of Schumpeter's dynamic system by listing the relevant relationships in the five variables: physical output, price level, money, income, net borrowings (or net repayments). The latter two terms we use for brevity, to indicate the increase or decrease of annual payments to income receivers due to the borrowing or repayment of debts (changes in velocity having the same effect as changes in loans outstanding). Of the five relationships, only the first four are considered in Schumpeter's first approximation, which, therefore, needs some additional, external assumption to explain the path: the emergence of a new (solid-lined) wave on Figure 1 does not follow at *A* from the existence of a preceding wave but requires a new impulse from outside. Only with the fifth relationship added (second approximation) does the system become determinate and may or may not give rise to periodicities. Here are the relationships: (1) money income equals output times price level; (2) rate of change of money income equals borrowing less repayment; (3) current output depends on past borrowing; (4) repayment depends on past borrowing; and (5) borrowing less repayment depends on the rate of change of prices. The first relationship (the equation of exchange) is an identity; so is the second, owing to the definitions used; the third—which may be a very complicated one—describes the change in pro-

ductivity and depends on the reaction of borrowers as well as on the technical character of specific innovations; it might also take into account changes in the degree of employment, an element which Professor Schumpeter neglects nearly, but not quite, as much as the Keynesian school neglects technological changes. The fourth depends on the duration of construction, or more specifically, on the modes of repayment of debts. The fifth relationship is Schumpeter's postulate on speculation, quoted above.

It is one of the great difficulties for the reader, and the reviewer, of this stimulating book that its author has abstained from formulating his assumptions in a dry language. He might have done so without detracting from his rich and vivid style elsewhere. As it is, the reviewer feels, yet cannot guarantee, that the five relationships he has suggested do give at least an idea of the theoretical system he is reviewing. The list ought to be made more complicated by splitting the output and the price level according to various commodity groups, and, within each industry, by distinguishing between revolutionary and conservative firms, to take account of the author's vigorous stand against "the curse of aggregative thinking." This would, in particular, convey Schumpeter's explanation, or at least one of his explanations (pp. 166–68), of the existence of waves of several lengths—corresponding to innovations of various kinds—superimposed on one another (Schumpeter's third approximation).

There is, however, an alternative interpretation of Schumpeter's intentions which, some readers think, is supported by many passages in the book. One gets, sometimes, the impression that the author does not want to explain the entrepreneurs' borrowing (the innovations) and the periodical fluctuations of its intensity as elements of a closed system of measurable variables. The entrepreneurial urge and ability come from outside of such a system. If that was Schumpeter's attitude, his second approximation would become superfluous, although not necessarily untrue. And he would have to give some other explanation of the periodical "clustering" of innovation, of entrepreneurial epidemics, so to speak. Traces of such an attitude can be found in the book (e.g., on p. 241), yet they are not sufficient to attempt a well-substantiated interpretation of the book on these lines rather than on the lines of a "closed" system suggested above in which at least some of the borrowers are encouraged or discouraged by the trend of prices.[1]

[1] When discussing Frisch's article on "Propagation and Impulse" (*Economic Essays in Honour of G. Cassel*) Professor Schumpeter does not oppose the inter-

Six chapters of theory are followed in the book by nine chapters of verification. The method used is largely that of a step-by-step comparison of what has happened and what could be expected to happen in a given year or decade, the expected pattern being that of "six Juglars to a Kondratieff and three Kitchins to a Juglar" (p. 173), where the proper names stand for the three waves (long, medium, and short) described by those three writers. The derivation of this pattern from the basic postulates of the system (such as the five relationships listed above, or any other) has not been worked out thoroughly in the book. In particular, one does not see clearly how the three dominant wavelengths derive from the empirical constants of those relationships—e.g., duration of construction and of life of specific kinds of equipment, responsiveness of speculators to price changes, etc. The method used and possibly the material available exclude the applicability of strict statistical tests which might show whether and which coincidences or discrepancies between fact and hypothesis have been due to chance or to recognized systematic causes.

However, the author's own cautiousness and skepticism must disarm any critic not entirely deprived of a sense of measure. It is not claimed by Schumpeter that any of the hypotheses is strictly true or more than merely plausible. Yet, any economist who like the reviewer can never dare to judge but is sometimes able to enjoy the writings of professional economic historians will not fail to enjoy even more Schumpeter's interpretation of the history of capitalism. That and nothing less is the actual goal of the book. There are no pure invariants in the economic system: the "social climate" changes visibly, and the beginning and the end of the 150 years considered in the book belong perhaps to different "systems." The change of the very "data" of the system, the noneconomic forces responsible for this change—perhaps some greater historical "laws" to which they are subordinated—loom

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pretation given by Frisch to Schumpeter's own theory as formulated in his earlier writings. Frisch's interpretation is on the lines of a "closed" system (see also p. 560, n. 2, of the book under review).

Besides the two possibilities we have discussed—(1) periodical innovations as *dei ex machina* and (2) innovations (borrowings) as a part of a closed dynamic system having the "speculation postulate" among its constituent relationships—there is a third one: to consider innovations as "erratic shocks" on an otherwise nonperiodic system. Cumulation of random numbers (such as formation of moving averages of such numbers) has been shown to generate periodicities. Schumpeter declines explicitly to make this arithmetical fact (the "Slutsky effect") a basis of an economic theory (pp. 180 ff.).

visibly behind the economic "skeleton." They are the real concern of the author. The lack of rigidity of economic "behavior parameters" must have made him—a student of economic history *and* theory—suspicious of "closed systems" such as the one suggested above by the reviewer in interpretation of Schumpeter's theory. Yet, that theory sets out to explain some observed (or allegedly observed) invariants, such as the duration of the long, medium, and short cycles. The theory must, therefore, assume that the relationships which constitute it are also not completely deprived of uniformity; and the "five relations" suggested above—or some similar or more complicated ones—appear again as a legitimate interpretation which may help the reader to understand the author's intentions and assumptions. This is the reviewer's difficulty.

Goethe denied, most aggressively, that Nature would ever yield her mysteries to those attacking her with laboratory weapons and submitting her to cold and rigid analysis. If History is more complex than Nature, the *Business Cycles* may have a greater chance than the *Farbenlehre* has had.

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The English Navigation Laws: A Seventeenth-Century Experiment in Social Engineering. By LAWRENCE A. HARPER. New York: Columbia University Press, 1939. Pp. xiv+503. $3.75.

The subtitle of this book explains its meaning. The author wants to show in how far the Navigation Acts attained their object—the fostering of English shipping and, more incidentally, shipbuilding. This plan is consistently adhered to. "The laws were English measures designed for English ends" (p. 242). Their influence upon the thirteen colonies is therefore considered outside the subject, being separately treated in an essay contained in the collection *The Era of the American Revolution*, simultaneously published. In accordance with the plan of the book, the first part gives the origins of the Acts, the second and third show administrative machinery in England and the colonies, respectively, while the last and most extensive part is concerned with a statistical evaluation of the results of the policy.

It may be said, in no disparaging sense, that the best part of the book is the Preface. The story of the book is there set out; how it was begun in 1925; how it was revised six times; how "literally hundreds"

of tests were attempted and discarded as not meeting the requirements of the case. Few descriptions of the planning of an investigation could be more reassuring. Besides, the author informs us of his legal practice in customs litigation; it would seem that he even possesses an inherited interest in customs administration.

The book is said to fulfil a practical object—to throw, through a study of historical experience, "some light upon the problems involved in our present social experiments" (p. viii). The task here allotted to historical study in my opinion is one for which it is eminently qualified; but it would require a serious examination of the changes which have taken place in the character of public administration during the last centuries, and especially in the nineteenth century. Of this there is practically nothing in the book, and it is therefore in my opinion unable to solve the practical problem which the author has set himself. His book must be considered as a contribution to history pure and simple.

The trouble taken by the author over his task is enormous; if genius is "the faculty of taking pains," this is the work of a genius. In at least the greater part of the book Harper has also been able to overcome what he himself calls "documentary indigestion"; and his own interest in his work is unflagging. He is at his best in Parts I and III. In the former he makes the interesting point that the clause requiring that ships should be English built, which meant much for the English shipbuilding industry, was due to administrative convenience, not to industrial interests, thus showing the element of chance always influencing "social planning." The comparison between the drafting of the initial act of 1651 and of the final system, for which the foundation was laid in 1660, from the point of view of practical efficiency, is also of great interest. The eighty pages devoted to enforcement in the colonies are clear and instructive, whereas the corresponding treatment of English conditions branches off into questions of administrative machinery and legal practice, of smaller relevance to the subject and less clearly expounded. Harper is a firm believer in the ability of the customs authorities, especially the commissioners of customs; so that "publicans and sinners," who have come off badly almost since time immemorial, have found their champion at last.

The main thesis of the book is that the Navigation Acts achieved their object—to foster English shipping—and that they were necessary for that purpose. It is probably not difficult to convince economists at least of that. For, as we all know, even Adam Smith praised the Acts for that very reason. "As defence . . . . is of much more importance

than opulence, the act of navigation is, perhaps, the wisest of all the commercial regulations of England. . . . . They [the regulations] are as wise . . . . as if they had all been dictated by the most deliberate wisdom." Another out-and-out advocate of laissez faire, a Swedish-Finnish clergyman of the name of Anders Chydenius—still perhaps the most interesting writer on economic and social problems in Swedish—had already eleven years before the publication of the *Wealth of Nations* denounced the Swedish imitation of the Act of Navigation, the so-called Proclamation of Products of 1724, in a pamphlet entitled *The Source of the Impotence of the Realm;* but he made no secret of the fact that that measure had raised Swedish navigation, merchant marine, and number of sailors to levels far above what they had been before. He goes on by pointing out, ironically, that many additional measures could be used to serve the same purpose, such as subsidies of shipbuilding, total prohibition of foreign vessels visiting the country, abolition of all duties upon imports and exports with premiums for both instead. "I believe that this would not be useless, only it would cost a little."

In other words, from an economic point of view, the most important problem is the wider implications of an "experiment in social engineering." Of this, Harper has very little to say, though he is convinced of beneficial results in other directions also. It would, however, have been instructive to start with a detailed consideration of Adam Smith's treatment of this wider problem, in order to find out in how far it may be considered proved or disproved.

Another side of the narrowing of the issue deliberately pursued in the book is the almost complete absence of a Continental European background. "What does he know of England, who only England knows?" In particular, the commercial and maritime development of the Netherlands, which touches the very core of the Navigation Acts, merited much more study than Harper seems to have devoted to it. He apparently ignores the thesis, now sustained especially by Dutch scholars, that the so-called economic decline of the Netherlands did not take place until the middle of the eighteenth century, when the English Navigation Acts had been in force for about a century. (The very illuminating article by C. H. Wilson, "The Economic Decline of the Netherlands," *Economic History Review*, May, 1939, probably appeared too late for consideration.)

If we confine ourselves to the more narrow problem—the effects upon English shipping and shipbuilding—it is clear that an answer

must, in the first place, depend upon the effectiveness of the code; for, if it were effective, the results would be almost inevitable. Harper has a high opinion of the efficiency of the system, at least in comparison to what has been generally believed. "Conceding that the evidence concerning enforcement of the laws in the case of European imports is not as convincing as that with respect to foreign shipping and the enumerated exports, it is none the less persuasive" (p. 271). We would be more easily persuaded by such a well-informed guide, if his conclusions were not almost invariably in one and the same direction. A great deal of the reasoning in this respect inevitably is a priori, and therefore the absence of a bias in the reasoner becomes important. To give a couple of instances. One of the reasons consists in the statement that "the colonists did not own sufficient tonnage to offer serious competition" (p. 259). How is it known that the vessels of smugglers were properly registered? Harper meets the objection that certificates might be forged—as was done to an enormous extent during the Continental System—by saying that colonials had not the requisite knowledge, "and Englishmen had little incentive to violate the Navigation Acts," the reason apparently being that more was to be gained by other contraventions (p. 256). Why could they not do both? Of this sort of special pleading there is a great deal in the book, and what is known of the times ought to make a historian suspicious on the subject of law-abidingness. Swedish officials of the time were considered rather above than below the average. Nevertheless, the farming-out of the Swedish customs to an able and ruthless official in 1718 more than doubled the revenue, in spite of there being no known external conditions to account for the change.

It is quite clear, however, that the enforcement of commercial and maritime regulation was considerably better than that of the industrial code, the internal regulation of industry, trade, and labor. A study of "social engineering" might profitably have compared these two fields.

The amount of statistics made use of is very great, and perhaps even the major part of it has had to be pieced together from a great number of sources, with an extensive aid of conjectures. Again, a great deal must therefore be taken on trust. I have scanned a few cases a little more narrowly and should like to give the results.

"The Trinity House recommendations in 1650"—consequently before the passing of the Commonwealth Navigation Act—"indicate rather clearly that one-half of the tonnage entering was foreign"

(p. 346). The accompanying footnote gives the basis for this estimate. As it was not recommended to exclude foreigners from some of the trades, "it seems only reasonable to assume" that English ships were entirely absent from them. "It also appears probable that the foreign tonnage averaged one-fourth of the total in the trades from which the Masters of Trinity House urged that they be excluded." Why precisely one-fourth and not, say, one-tenth? If this is what is meant by a "rather clear" indication, the doubtful ones must be doubtful indeed. But on the basis of this reasoning the figures for 1649–50 are tabulated as 50,957 tons English and 50,957 tons foreign shipping, while the figures for 1663–69, when the Navigation Acts were operative, are given as 95,266 for English (consequently almost double the previous result) and 47,634 for foreign shipping (a decrease since before the passing of the Acts). It is difficult to give much weight to a proof of this character. (By the way, Harper invariably gives the results of even the most hazardous guesses up to the last unit, instead of making the figures round.)

As a second case, I select a small table showing Anglo-Dutch shipping before and after the passing of the Navigation Acts (p. 302, n. 15). Before 1651 inward shipping is there given as 467 English and 358 foreign ships, or 56.6 and 43.4 per cent, respectively; outward figures are 309 and 32, or 90.6 and 9.4 per cent. After 1660 inward is 308 and 27, or 91.9 and 8.1 per cent; outward 514 and 34, or 93.8 and 6.2 per cent. The first suspicious feature of these statistics is that there is not only a complete discrepancy between inward and outward shipping but that these two groups have also exchanged place between the two dates; before 1651 there were 825 ships inward but only 341 outward, while after 1660 the figures were 335 and 548, respectively. Consequently, the great relative increase in English inward shipping, which is the most important result, means an absolute *decrease* of no less than 34 per cent. This, to say the least, does not give the impression that the figures represent normal conditions. Further, it is found that inward shipping before 1651 is entirely dominated by one single port, Yarmouth, which had almost half the English and more than half the foreign shipping shown in the table. But, after 1660, Yarmouth's shipping had dwindled to between one-sixth and one-seventh of English shipping; in foreign tonnage there was only a single ship coming from there. When, finally, it be added that Yarmouth figures "after 1660" represent only a single year, I think everyone will agree that figures of this description hardly prove anything at all.

It is also unfortunate that Harper, on principle, denies that absolute

changes have any weight at all. When, e.g., one group of figures rises by 1,284,000 and another only by 660,000 (p. 351, n. 79) the second change is considered the only one of importance, because the relative change is much greater; a change in absolute figures "means nothing" (p. 356) and is even considered a "wrong statistical base" (p. 351). It ought to be beyond discussion, on the contrary, that small magnitudes frequently change more than large ones, relatively, without this proving much more than that they are small; even the smallest increase from zero is infinity. Lastly, it is a pity that almost all these peculiarities are made use of to fortify the thesis put forward by the author.

Harper, on the other hand, merits praise for being, at least as far as I know, one of the first scholars of an English-speaking country making extensive use of the Sound Toll Accounts, one of the most invaluable sources of the history of international trade and shipping extant. I much regret to have to add, however, that Harper does not appear to be informed of the important investigations which have been going on for at least fifteen years into the true inwardness of these accounts; they require to be used with much more circumspection than he is aware of (cf. p. 423). A preliminary result of these new investigations was given in 1934 by A. E. Christensen in the *Hansische Geschichtsblätter*, in a lengthy article entitled "Der handelsgeschichtliche Wert der Sundzollregister."

One small point, finally. Harper consistently fails to distinguish between "mercantile" and "mercantilist." When the first sentence of the book speaks of "mercantile measures" or chapter ii is headed "The Mercantile Mind," the word probably stands for "mercantilist." On the other hand, in "the mercantile community" and "mercantile training" the sense must be "of merchants." But how is one to interpret, e.g., "mercantile favorites," "mercantile point of view," "mercantile critics," or "mercantile background"?

I should much regret if this review would be found to stress unduly what the reviewer considers the defects of Harper's imposing volume. If so, the reason simply is that strictures should be supported by argument and evidence, while praise may be given in a few words. After all, I think my objections to Harper's treatment of the subject may be summed up in a sentence used to characterize no less a historian than Macaulay, to the effect that he had chosen to "take his seat not on the bench but at the bar of history."

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France: A History of National Economics, 1789–1939. By SHEPARD BANCROFT CLOUGH. New York: Charles Scribner's Sons, 1939. Pp. ix+498. $3.50.

"A study of the Revolutionary and Napoleonic periods," writes Professor Clough, "shows that increased national sentiment, class interest, economic depression, foreign competition, economic theory, and the exigencies of war accounted for the direction of French national economic policy." "These same factors," he adds, "were predominant in subsequent French history" (p. 358). Professor Clough brings out shrewdly the operation of these factors in his very readable, objective, and illuminating account of the economic development of France from 1789 to the present day. Some attention is paid to the period from 1500 to 1789, both because of the author's belief that "French national economics of the nineteenth and twentieth centuries is a direct descendant of the French state economics of the sixteenth, seventeenth, and eighteenth centuries," and because modern national economics has its earlier prototype in the era of mercantilism (p. 31).

Professor Clough correctly emphasizes that the earlier period differed in an important sense from the one which followed 1789, in that state intervention did not operate in an environment of democratic nationalism. In that respect, it may be added, the Revolution of 1789 marks a turning-point not only for France but also for all of the Continent, which it endowed with the trinity of revolution, democracy, and widely diffused nationalist sentiment. For France, moreover, the Revolution represented the sweeping-away of feudalism in both its rural and its urban aspects, and the rise of the third estate to political power. The author tends to create the impression that in this rise to political power the bourgeoisie displaced the nobility (pp. 33, 358). To be sure, the nobility was a privileged class, particularly with respect to the burden of taxation, but it was also politically impotent in the face of the alliance of inept absolutism and corrupt high finance which characterized the *ancien régime*.

It is possibly symptomatic of the present-day great enhancement of the role of the state that writers manifest impatience with the classical interpretation of mercantilism and tend to give it instead a political emphasis. Professor Clough shares in this critical attitude toward the classical interpretation. Moreover, in place of the term "mercantilism" with its connotation of the dominance of mercantile capital directing policy to the accumulation of treasure and the maintenance of a favorable balance of trade, he prefers the concept "national economics" as indicative of an economic policy dominated by the state

and directed to the increase of its power and prestige (p. 355). Political power was conceived to be contingent on national economic strength as measured by production and productive capacity (p. 8). The latter, in turn, it was held could be augmented by state aid extended to the capitalist class (p. 260). What is of more interest for the period with which our author is mainly concerned, the foregoing conception of the relation of politics to economics is extended to the career of modern occidental communities down to the present day.

There are certain advantages in this emphasis on the continuity of state intervention. It may serve as a corrective to the demarcation of historical epochs in terms of the academic career of economic theory. The case of France is particularly illuminating. It was the stronghold of liberalism in economic theory during the nineteenth century, and yet it was only in the decade of the sixties that liberal economics was translated into practice in any consistent fashion, and then only in the field of international trade.

The category "national economics" suffers, however, from inadequate analysis. Such analysis may reasonably be expected from a study which, not content with excellent historical narrative, proceeds to explicit generalization. We refer primarily to chapter i and to the concluding chapter. Moreover, in the light of our present predicament, historical conceptualization which accords no explicit recognition either to the rise of political democracy or to its contemporary decline is likely to provoke a measure of dissatisfaction. In the first place, for France in particular, the unanalyzed category does not do justice to Professor Clough's own recognition of the immense transformation, ideological and institutional, affected by the French Revolution. More important, this lack of conceptual analysis has led Professor Clough to blur the distinction between the role of the state in political democracies, on the one hand, and in the totalitarian communities, on the other.

We refer, of course, to the period prior to the outbreak of the present World War. It is possible that for those relatively halcyon days the category "national economics" might well be reserved for a collectivized state like Soviet Russia. It is possible, also, that Professor Clough should not be criticized for neglecting the themes of political democracy and planned economy, for what he has really set out to do is to develop the inescapability of a large amount of state intervention in the affairs of modern communities. That he has done eminently well.

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La Théorie quantitative de la monnaie. By PAUL LAMBERT. Paris: Librairie du recueil Sirey, 1938. Pp. 271.

The author of this book gives evidence of careful and reasonably wide reading; and a critic is further disarmed by the modesty with which the author disclaims any pretense to have uncovered important "new" truths (pp. 1 and 261). In these days such modesty is not only refreshing; it is courageous. In the present instance the author's courage is further evidenced by his refusal to fear the charge that too many of his conclusions are of a "negative" character. "A certainty," he reminds us (p. 260), "*positive or negative*, is always an acquisition for science. . . . . It is just as important to know the roads that have become mired [*les chemins embourbés*] as it is to know the main highways [*les routes royales*]."

The real tragedy, of course, is that it should have been necessary for a hundredth time to warn uninstructed travelers that certain roads which they suppose to be *routes royales* have time and again been shown to be nothing but *chemins embourbés*. M. Lambert has found it necessary, for example, to provide extensive documentation in support of the proposition that controversy concerning the "truth" or "falsity" (and even the usefulness or the uselessness) of something called "the quantity theory" is bound to be futile in the light of the simple fact that there is not *one* "quantity theory" but "an almost infinite number" of "quantity theories" (pp. 3 f., 10 ff., 52, 76 ff., 87, 253 ff.). He has found it necessary to insist again (pp. 79 f., 111) upon distinguishing the issues involved in the myriad versions of "the quantity theory" from those involved in devices such as Fisherine quantity equations, here accepted not only as "incontestable," when properly stated (pp. 54, 58, 89, 107, 111, 147, 150, 163, 216, 256), but also as "precious instruments of economic analysis" (pp. 106, 111 f., 256). These propositions, and others advanced in the book under review, are of course the most obvious of platitudes to the instructed; but the fact that it should have been necessary to repeat them is to be blamed not upon the author of this book but upon those uninstructed "revolutionaries" whose utterances show that, whatever their talents otherwise, they are not sufficiently instructed to recognize a platitude when they meet one.

For all its merits of tone and substance, however, this book provides an illustration of a further proposition which is relevant for an evaluation of any work of critical reinterpretation of received doctrine, such

as the book under review is intended to be. One respects the modesty which leads the author to state, in his closing paragraph (p. 261), that his object was "not to bring a contribution to a complete explanation" of the problems he discusses. Unfortunately, however, experience has shown too often that in cases in which the task of criticism and interpretation is separated from the task of *further construction*, both criticism and interpretation are likely to suffer, *as* criticism and interpretation, for lack of the kind of positive grasp of analytical techniques which is vouchsafed only to those of enough constructive power of their own to see the next step ahead and to take it. Examples are provided, in the present instance, by the author's inadequate appreciation of Hawtrey's classic contributions to the theory of the generation and utilization of money income (pp. 64 ff., 130, 203 ff., 219 ff.) and by his failure to see the possibilities inherent in the use of a series of "partial" equations of the general Fisherine form, leading to a "plurality of price levels" (pp. 114, 123, 188, 256).

The clearest instances, however, of missed opportunities for further construction, which would simultaneously have provided a sounder basis for criticism and interpretation of earlier writers, are provided by the author's discussion of "The Passivity of Prices" (pp. 48, 54, 58 f., 63, 84 ff., 190 ff.). The reviewer would be the last to accept all that has been said in the name of this "passivity." Yet he cannot help regretting that the author has not explored the possibilities, for the range of problems which he includes under the head of "The Passivity of Prices," of the use of (1) a clear distinction between *realized* prices, on the one hand, and *ex ante* prices (of which "expected" prices would be a subdivision), on the other; (2) a clear appreciation of the meaning and substance of "period analysis," as applied to a sequence of events realized in clock time; and (3), above all, a clearer appreciation than is evidenced on page 186, and particularly on pages 212 ff., of the relation of demand and supply schedules of the Cournot-Marshall type to a system of realized streams of money and realized streams of objects sold for money, and therefore of realized prices. The importance of (3), in particular, can be realized only by those who know what it can be made to mean for an adequate theory of the *structure*, as well as of the *level*, of prices, of incomes, and of output: a theory constructed along lines which the Walrasian system, when creatively and imaginatively interpreted, may be said to have adumbrated. Yet it would be most unfair to this book if the reviewer did not add that the generally high level of intelligence which its author shows in this, apparently his

first extensive published work in the field of monetary theory, is such as to encourage the hope that he will himself play an important role in the impending work of further construction.

ARTHUR W. MARGET

University of Minnesota

Golden Avalanche. By FRANK D. GRAHAM and CHARLES R. WHITTLESEY. Princeton: Princeton University Press, 1939. Pp. xv+233. $2.50.

In this readable and stimulating volume Graham and Whittlesey have given us a survey of the gold problem, which is bound to arouse interest and discussion. Whether the conclusions of the authors will find general acceptance or not, they will have contributed greatly to an understanding of the unprecedented inflow of gold over the last seven years.

In an interesting presentation they marshal the relevant facts: magnitude of the inflow of gold, distribution of supplies, supplies relative to requirements, etc. Then they explain the inflow largely in terms of capital movements stimulated by the unwise (?) American policy of a fixed price for all gold offered to the monetary authority. Finally, they consider numerous ways out, commenting briefly on numerous alternatives and proposing finally an ingenious dual price system of gold, which will have the effect of discouraging output abroad and sales in the American market and yet not require a revaluation of gold stocks and accompanying losses at home.

On one vital issue, to which I now turn, I disagree. The general impression obtained from an examination of this volume is that the United States has paid heavily for the ten billions of gold received since 1933. On page 57 the authors quite rightly point out that in view of the large amount of *uncashed* claims here, which have been obtained through the shipments of gold, the real losses are as yet small. The serious discussion of this problem is, however, to be found in chapter v. We are told on pages 83–84 that whether we cut the price of gold or do not, "each of these courses entails either the reality or the recognition of heavy loss to this country," and on pages 99–100 that we have been giving our goods away. It is then suggested that we re-export our gold in the future in order to recoup part of our losses.

What the authors have failed to take into consideration is the significance for their analysis of underemployment of economic resources.

Goods may be given away, as they contend; but the correct implication is not, however, that in giving these goods away the American people are deprived of an equivalent amount of goods. We must ask ourselves whether in the absence of this foreign demand the goods, which have been exchanged for gold, would have been produced. What is more, the thesis may be held (on the principle of the foreign-trade multiplier) that even if three billion dollars of goods were exported that otherwise would not have been exported, and even if we obtained valueless (?) gold in exchange, a net gain *may* be imputed to the inflow of gold and the export of goods. A rise of exports of three billions of goods may account for a rise of output much in excess of three billions. It is also necessary to remind the reader that of gold imports (net) of ten billions from 1934 through 1939, only three billions are to be associated with an excess of exports and, even more significant, a little more than two billions are to be associated with credits on current account.

This raises a fundamental issue. The stimulus of business through the exchange of goods and property rights (promises of goods) for gold does not seem the most rational economic policy, even on the assumption of large amounts of unemployment. On their economics I therefore am in substantial agreement with the authors. It is unfortunate, however, that they do not distinguish between the economics and the politics of the issue. The purchase of gold at a fixed price may be considered a desirable policy not because it is the wisest policy but because it has been a practical method of stimulating the economy. If gold purchases had ceased, I see no strong reason for assuming that other stimuli of equal or greater effectiveness would have been introduced. More production and more goods for Americans, the economical ideal, of course, are much to be preferred to what is being obtained, i.e., more production and disposal of at least part of the increased supplies of goods to foreigners. In the actual world we have to accept less than that which we might have had.

May I also express mild dissent on several other points. I have space to comment but briefly: (1) The authors overstress the part played by our gold policy in accounting for the continued inflow of capital (pp. 56–59). (2) Great Britain loses gold and yet, it is held, exports do not rise. According to the authors, part of the explanation is that the export of gold tends to raise the value of sterling (p. 51). In this connection, however, the whole period 1931–39, in which period Great Britain was an importer of gold, should be considered; and, therefore, it should be held that the net effect of gold movements was to depress

sterling. (3) Do not Graham and Whittlesey (p. 70) put rather strongly the degree of control over the exchanges which British authorities are able to exercise through absorption or release of gold? "So long as they have a substantial stock of gold and are willing to reduce or increase this stock, they can put exchange rates practically where they will" (p. 70). (4) Will stability of exchanges "almost automatically follow if the price levels in different countries remain more or less in harmony"? (p. 95).

Despite these differences, I hasten to add that I find this volume a welcome addition to the literature on unorthodoxy in monetary policy.

S. E. HARRIS

Harvard University

The Treasury and Monetary Policy, 1933–1938. By G. GRIFFITH JOHNSON, JR. ("Harvard Political Studies.") Cambridge: Harvard University Press, 1939. Pp. 230. $2.75.

"In ordinary times the principal contact between the Treasury and the credit situation has traditionally lain in the management of the public debt, together with the movement of government balances; but during the Roosevelt administration such factors have been vastly overshadowed by other and more momentous monetary ventures, and it is with these latter that we shall deal" (p. 7). Although Dr. Johnson holds that "monetary instruments effectively operate only on the quantitative aspect of the credit situation, and primarily in terms of the volume of member bank reserves" (pp. 217–18), he does not show the consolidated impact of Treasury operations upon the volume of such reserves. Instead, he devotes separate chapters to the gold policy (chap. ii), the stabilization fund (chap. iv), the sterilization policy (chap. v), and the silver program (chap. vi), but not to the management of the debt or government balances. He does, however, present ingenious estimates of the amounts involved in the operations of the stabilization fund.

When he enters the sphere of policy formulation (chaps. i, vii, viii), Dr. Johnson apparently abandons his primary purpose which "is not to render judgment but to delineate" (p. 8). He faces the age-old dilemma: "monetary control by a politically irresponsible or independent agency" (p. 222) *versus* "political management of money" (p. 223) with courage. When viewed from the vantage point of the 1920's, the Financial Committee of the League of Nations as well as the Brussels and Genoa conferences voted for independent central

banks. But "when viewed in the light of the crisis of our capitalistic, democratic economy," Dr. Johnson says, "the dangers of political management of money sink into comparative insignificance, and one cannot begrudge the government whatever weapons are available to increase the effectiveness and expedition of its intervention" (p. 223). But that is not the whole picture. "Responsibility to Congress is desirable from a practical viewpoint only in the degree that Congress exhibits *intelligence* and *moderation* in monetary matters, whereas up to now the evidence of immaturity and ignorance seems preponderant" (p. 216, reviewer's italics). Dr. Johnson recommends "continuous consultation and contact with the administrative authorities through . . . . preferably a permanent joint committee of both Houses" (p. 215), but until Congress matures ". . . . responsibility will have to be assumed chiefly by the Executive" (p. 216).

KARL R. BOPP

University of Missouri

The Cod Fisheries: The History of an International Economy. By HAROLD A. INNIS. (Prepared under the direction of the Carnegie Endowment for International Peace, Division of Economics and History.) New Haven: Yale University Press, 1940. Pp. xviii+520. $3.50.

This work is a monument of erudition in the field of meticulous, factual economic history. The reader is always impressed and sometimes overwhelmed by the evidences of beaver-like industry displayed in the uninterrupted flow of facts and figures and in the hundreds upon hundreds of footnote references to little-known source materials. In fifteen chapters, covering some five hundred closely packed pages, there are more than thirteen hundred footnotes.

Obviously, in this type of compendious and perhaps definitive treatment, both author and reader are in grave danger of losing sight of the sea for the fish. It is always easy to become lost in a mass of details, especially when so many of them form unusually small and unimportant parts of the whole. This tendency is still further accentuated when so much of the material is cast in the past tense. In an outline which is strictly chronological it requires twelve of the fifteen chapters and more than four-fifths of the pages to bring us down to the year 1886, leaving only two chapters (aside from the concluding one) for the last half-century.

It should be added in haste, however, that the purpose of these remarks is not to criticize the book but to point out the defects of its

qualities. If the purpose of economic history be to discover, to describe, and to analyze the economic factors underlying a given segment of historical development, then Professor Innis has given us here a masterly performance.

This is a study of the economics of the cod fisheries, which form the backbone of the fisheries of New England and the Canadian Maritime Provinces, from 1497 to 1936. At first there was rivalry between Portuguese, Spanish, French, and English fishermen in the exploitation of the fabulously rich fishing banks—but after a time the first two dropped out and left the French and English to fight it out alone. The voyages, the methods of financing and of wage payment, the markets, the handling of the product, the geography and technology of the industry, are all described in great detail. Thereafter we follow the fortunes and the influence of the cod in connection with the rise and fall of mercantilism, the opening up of the West Indies, the struggles between the French and British empires, the American Revolution, and the growth of New England and its many fishing quarrels with the Maritime Provinces. Another section of the book traces the evolution of the industry from private fishing through commercialism to small-scale capitalism, and outlines the profound influence of the cod upon the economic life of Nova Scotia and its less happy effects upon Newfoundland.

Since the juridical and political aspects of these British-French and Canadian-American fishing disputes have been covered in many other works, Professor Innis wisely restricts his analysis to the economic aspects of the fisheries and their outcroppings in cultural, military, and international patterns. Within this field the work may well prove to be definitive, for it is difficult to perceive any need for a more intensive treatment of the subject.

ELMO P. HOHMAN

Northwestern University

Reciprocity, 1911: A Study in Canadian-American Relations. By L. ETHAN ELLIS. (Prepared for the Carnegie Endowment for International Peace, Division of Economics and History.) New Haven: Yale University Press, 1939. Pp. x+207. $2.50.

This scholarly contribution to the history of Canadian-American relations demonstrates the decisive part which internal politics play in foreign affairs. The willingness of both President Taft and Sir

Wilfrid Laurier to enter into reciprocity negotiations, the author shows, as well as the ultimate fate of the project, was conditioned as much by internal dissensions in their respective parties as by external opposition. Taft won his battle by virtue of an alliance with the Democrats but at the cost of deepening the split in the Republican Party. Sir Wilfrid Laurier and the Liberals lost their battle and with it their control of the Canadian government. The United States accepted the agreement but Professor Ellis shows that the delay resulting from the rejection by the American Senate of the Reciprocity Bill in April, 1911, made it impossible for Sir Wilfrid to take advantage of the favorable attitude then prevailing in Canada.

Making skilful use of the record of debates in Congress and in the Canadian Parliament, as well as American and Canadian newspaper files, the author takes us behind the legislative scenes, revealing the maneuvering of pressure groups on both sides of the border. The American farmer, during the debate on reciprocity, became a large factor in the tariff struggle, owing in part to the funds which American paper manufacturers contributed to finance his propaganda. Newspaper publishers wishing to assure their presses a continuous supply of Canadian newsprint were just as active in favor of the Reciprocity Bill.

Canada's rejection of reciprocity was largely determined by sentiment—nationalistic and imperialistic. Canada feared that greater economic dependence on its powerful neighbor to the south might endanger national unity, which, it was argued, depended upon the continuance of a large volume of east-west trade. Closer ties with the United States it was thought might weaken the growing spirit of imperial unity.

Historians will value this monograph for its fully documented narrative. Students of American commercial policy will find in it a striking contrast of two methods of tariff-making. Cautious negotiations were first undertaken by administrative officials, leading to an agreement which was announced in specific terms January 26, 1911. But when the agreement was submitted to the legislative bodies in Canada and the United States, powerful economic and political interests took a hand to prevent its ratification by outright opposition and by injection of extraneous issues. On them rests the responsibility for defeating a measure which, had it been adopted, might have had far-reaching effects on the subsequent policy of both countries. Professor Ellis' discussion of the failure of reciprocity in 1911 provides a

useful commentary on the demands of certain American senators that the Hull trade agreements be submitted to the Senate for confirmation.

The author devotes much attention to the activities of economic groups, wheat growers, cattle ranchers, lumbermen, paper makers, and newspaper publishers. But he provides little statistical information on the extent or character of the trade across the border.

The economic results which might have followed ratification he is inclined to minimize, finding unlikely "any vast change in prices, wages or cost of living. . . . ." The effects he believes would have been confined to local areas on both sides of the border. "The most important effects of reciprocity . . . . would not have been what it actually accomplished but what it presaged." This conclusion, it seems to the reviewer, does not take full account of the change in competitive conditions in the decade 1900–1910 which, had tariff duties been abolished, might have caused large exports of Canadian beef cattle and hard spring wheat into United States markets.

PERCY W. BIDWELL

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Economic Relations with Latin America: Proceedings of a Conference Held as a Part of the Institute of Latin American Studies, Ann Arbor, August 11–12, 1939. Edited by D. M. PHELPS. ("Michigan Business Papers," No. 6.) Ann Arbor: Bureau of Business Research, School of Business Administration, University of Michigan, 1940. Pp. 75. $1.00.

In this report are contained an introduction by W. S. Culbertson, seven papers by businessmen and economists on various aspects of foreign investment in Latin America, three papers on measures for facilitating trade between the Americas, and the discussion of these papers by the twenty-two members of the conference.

The defaults, expropriations, and threats of expropriation which have so seriously worsened the prospects of foreign investments—both portfolio and direct—were accounted for variously in the papers and discussion. Apparently regarded as most important are the export difficulties of Latin America and the consequent scarcity of foreign exchange. These difficulties were considered due to trade restrictions and to price declines in foods and raw materials. Such conditions contribute to bilaterialism and exchange control. Attention was drawn to in-

creased nationalism as a factor in hostility toward alien enterprise, based on belief of some Latin Americans that such enterprises are not well integrated to their economies. As counterargument it was insisted that most American companies in Latin America neither "exploit" nor "dominate" but play a normal economic role. The possibility of gradual Latin-American financial participation in these companies was suggested as a contribution to better relations.

The papers and discussion devoted to the problem of trade facilitation agreed in general that both the good-neighbor and the hemispheric defense policies were unlikely to be translated into reality except through increased trade. This was considered dependent on a reduction of trade barriers, the political and economic difficulties of which were discussed at length. The prospect of increased industrialization in Latin America might, it was conceded, change the constituency of our trade with that area but should not cause a decrease. The majority of the conferees seemed to approve the continuance of the unconditional most-favored-nation policy in our trade negotiations with Latin America.

FRANK A. SOUTHARD, JR.

Cornell University

The Investment Value of Goodwill. By LAWRENCE N. BLOOMBERG. ("Johns Hopkins University Studies in Historical and Political Science," Series LVI, No. 3.) Baltimore: Johns Hopkins Press, 1938. Pp. 70. $0.75.

This monograph is the outgrowth of a doctoral dissertation undertaken with the purpose of comparing "the investment values of goodwill and tangible property." Starting with the premise that the investing public has hitherto underestimated the investment value of good-will in favor of tangible assets, the author has attempted to measure statistically the extent of this prejudice against intangibles.

To do this, he has compared the investment experience of groups of companies which possessed a considerable amount of good-will but little in physical assets with other groups which owned large physical properties but little good-will. The study, therefore, represents a comparison of the investment results realizable from two types of common stocks held over selected periods of time. The general procedure followed is somewhat similar to that employed by Edgar L. Smith in his *Common Stocks as Long Term Investments.*

The first step in making this comparison was to develop a basis by which to separate the individual companies into the good-will and the physical property groups. Lacking a better criterion, the author relied largely upon his personal judgment as to the nature of the business of the individual companies. "Goodwill stocks were considered to be those of companies which were believed to possess a substantial quantity of buyers' attachment. Such concerns included those which supplied services (exclusive of public utilities) and those which produced differentiated or branded products." On the other hand, the physical asset stocks were considered to be those "of companies which possessed natural resources or producing mechanisms and physical plants which were of themselves valuable. They sold undifferentiated products and often manufactured according to specifications."

The next step was to determine the mode of sampling to be used. The stock samples were selected from the list of industrial common stocks traded on the New York Stock Exchange during the first few days of each period studied. After classifying these stocks into the good-will and physical property categories, individual stocks in the various samples were chosen by lot, an effort being made to avoid overconcentration in any one industry.

Next, the periods were selected over which the investment experience of the sample stocks was to be measured. Four separate periods were selected: 1912–37, 1927–37, 1929–33, and 1919–23. The first period afforded a long-run comparison of twenty-six years, the second provided a comparison over a recent decade, and the last two permitted comparisons during short periods of extreme price fluctuation. Each of the last two periods was divided into two parts, one reflecting steeply falling prices and the other rapidly rising prices.

Finally, the method of measuring the investment experience of each stock in the various samples was determined. It was assumed that approximately one thousand dollars was invested in each stock at the average of the high and low quotations during the first few trading days of the period under survey. The investment history of each stock was then traced throughout the period. The market value of each stock was determined at the end of each year by using the average of the high and low quotations (or bids) on the last trading day of the year. Total dividends received during the year were tabulated. Any stock rights received were assumed to have been sold at the average of the high and low prices of their life, and the proceeds placed in a savings account at 3 per cent interest. Fractional shares from stock

dividends were similarly handled. Yields from the various stock samples were computed by dividing the total income received during the year by the original investment in the sample.

The results of these various tests indicate a surprising advantage for the good-will stocks. Over the long period 1912–37, this group (excluding the unusually favorable experience of General Motors) showed an appreciation of 8.66 per cent compounded annually in comparison with a rate of 0.6 per cent for the physical asset stocks. The trend of the current yield of the good-will stocks was upward, averaging 16 per cent for the period and closing at 26 per cent for 1937. On the other hand, the trend of the yield of the physical asset group was horizontal for the period, averaging about 6.6 per cent.

The other tests apparently substantiate this conclusion. The good-will stocks showed to advantage during the 1927–37 period (excluding Dome Mines from the physical asset group), although their advantage was not so marked. Even during the two short periods of sharp price changes, the good-will stocks did not drop so far on the downswing, and they rose somewhat higher on the recovery.

The author's explanation of the apparent advantage of the good-will stocks is twofold. In the first place, they were undervalued by the investing public because most of the companies studied produced specialized consumer goods, the market for which depended largely upon advertising and the ability to develop trade-name monopolies. In other words, investors were prone to place greater reliance on the possession of physical assets. In the second place, the physical asset companies suffered from certain operating disadvantages, such as a heavier local tax burden, heavier maintenance expenses for plant, and the inability to meet a material increase in demand for their goods without substantial plant expansion.

The author is to be congratulated on his careful study. He has added something to the considerable body of knowledge concerning the investment experience of common stocks, and he has thrown some light upon the investment market's appraisal of corporate good-will. The results of the study, however, cannot be taken too literally, as is suggested by the following observations.

In the first place, good-will is defined as "buyers' attachment to a company" or "the favorable attitude of the persons to whom a company sells," which causes buyers to "form the habit of dealing with the company." The reviewer has no quarrel with this definition except, possibly, its extreme intangibility. It should be emphasized, however,

that the term as used in this study has no reference to the balance-sheet account "good-will" which appears on many corporate financial statements. Under the definition employed, companies which reported no intangible assets whatever on their balance sheets could still be listed as good-will companies.

In the second place, the classification of companies into the good-will and physical asset group was arbitrary. That the complete intangibility of the definition of good-will rendered this unavoidable is freely admitted by the author, who states: "Of necessity personal judgment has played a large part in classifying the companies." As defined, every going concern possesses some good-will, which made it necessary to decide on the basis of meager information which companies possessed more good-will than others. Although the writer undoubtedly made a conscientious effort to be fair in his grouping, it is apparent that personal opinions will differ widely with repect to individual companies.

Finally, the author's explanation of the superiority shown by the good-will stocks on the ground that investors believed them to be of higher risk deserves some comment. It will be recalled that the good-will group showed to greatest advantage over the period 1912–1937. It is quite possible that these stocks were relatively undervalued in 1912 at the time of hypothetical purchase. At that time common stocks as a class were generally regarded as undesirable investment media. Further, the group of physical asset stocks, from which the test sample was selected, comprised the older and better-known corporations of that time.

As common-stock investments acquired more popular favor after 1920, it is unlikely that the good-will stocks listed continued to be undervalued by investors. Indeed, the opposite is more likely to have been the case. The good-will stocks studied represented the consumer goods industries for the most part whereas the physical asset stocks came chiefly from the producer goods fields. During the past decade or so the latter group has generally been regarded as carrying materially higher business risk than the former. Some other explanation of the better showing of the good-will stocks since 1925 is more plausible than that of investor undervaluation.

JAMES C. DOLLEY

University of Texas

The Business Man's Stake in Government Finance. By HARLEY L. LUTZ. (Lectures Delivered at the Third Annual Stanford Business Conference, July 17–21, 1939.) Stanford University: Graduate School of Business, Stanford University, 1940. Pp. vii+119.

This is a series of five lectures delivered at the Third Annual Stanford Business Conference. It is five rounds of sharp attack upon current fiscal policies and theories. The author finds himself a realist in a very romantic world of public finance.

Professor Lutz is of the opinion that current fiscal policies for dealing with depression and unemployment were misconceived and have served to aggravate and perpetuate what they set out to relieve. Contrary to widespread belief, taxation can have no effect upon purchasing power (except to transfer it), though it may reduce production and cause unemployment by weakening incentives and cutting into the capital fund. An income of $1,000,000 is twenty times an income of $50,000, but after income taxes are paid, the residue is only about seven times as great. This destroys the pioneering spirit and the appetite for risk-taking. Public debt is justified if it is incurred to enlarge income and is retired during the life of improvements. Recent additions to the debt fail miserably to meet these tests. The cyclical budget is attractive but impractical. The double budget (with a separate statement for capital items) is a device for deceiving one's self and the public. The pessimism of those who talk of a contracting economy is entirely unwarranted. If the declining birth rate were really serious, we should abandon restricted immigration. Improving the general standard of living constitutes a quite adequate frontier.

The expanding public debt, according to the author, constitutes a grave problem for investors; debt, like everything else, must follow the economic law that value falls with large increments to supply. The debt has been expanded in a very artificial and abnormal market; and, when there is a return to normal demand for investment funds, the price of public securities will fall sharply. The Federal Reserve system will attempt to maintain bond prices, but it is doubtful if it will succeed, at least without creating important social evils such as inflation.

From the foregoing one might expect the author to favor the elimination of tax-exempt securities. On the contrary he is of the opinion that they are a necessary condition for the fiscal independence of the states, that elimination would cost more in higher interest than it would yield in taxes, and that present interference of tax exemption with the opera-

tion of progression is not serious in view of the evidence that large fortunes show a relatively small proportion of tax exemptions.

Concerning taxes, the author's sentiments are apparent in his statement that in states which have avoided an income tax "the common sense of the people has thus far triumphed over the speculations of the tax theorists." The ability-to-pay theory is largely romance, and Lecky was right when he said that progressive taxation is the supreme danger of a democracy. The net income tax is mostly "flummery" because net income is not properly defined and ability to pay, once realized, evaporates before it is taxed. A gross income tax is preferred to a net income tax, and a large place for indirect consumption taxes, a revenue source considerably maligned by the romanticists, is recommended.

This is not the place for debate, but a few questions suggested by Lutz's monograph may be raised. If the tax system may result in undersaving, may it not also aggravate oversaving? If heavy taxation has so greatly weakened the incentive for risk-taking, how account for the author's own figures showing only minor investments by large fortune-holders in tax-exempt securities? What would the author offer to the unemployed and to balance the budget while the gamble of new jobs and increased income through restored incentives to private industry was being tried? How do many other countries manage to escape the dire consequences predicted for the elimination of tax-exempt securities? Is the author serious in contending that gross income, with no allowance for differential expenses of any kind including impairments to capital, offers a more equitable base for taxation than net income?

Lutz's role as an assailant of the ability-to-pay theory, of progression, and of the income tax, and as a proponent of gross and indirect taxes, has developed mainly since the publication of his last book. His counsel in this century is reminiscent of J. R. McCulloch's in the last. This monograph is an able presentation of one point of view in public finance.

HAROLD M. GROVES

University of Wisconsin

The Growth of Federal Finance in India: Being a Survey of India's Public Finances from 1833 to 1939. By P. J. THOMAS. New York: Oxford University Press, 1939. Pp. xi+558. $7.75.

This solid but stolid book surveys the history of public finance in India from 1833, but it would be wrong to surmise from the title that it was concerned with federal finance. At the outset administration of

a subcontinent containing one-fifth of the world's population was centralized in the hands of officials, and they in turn were responsible to Whitehall. India was given honest and orderly government, but the inflexible bias of the minds of officials toward English institutions was repeatedly manifest in finance. An income tax was established, customs duties were reduced, and government participation in business was frowned upon.

The extreme centralization was, indeed, subject to attack as quarrels with the provinces demonstrated its ineptitude, and after 1870 steps were taken toward devolution. But the driving force was the desire to give relief to the finances of the central government rather than a genuine effort to promote provincial self-government. The Indian people were deemed unfit to exercise a control over administration, and therefore, so the argument ran, the central authority, responsible to the British Parliament and people, had to be maintained.

This philosophy became more and more incompatible with the times, and in 1919 India began to move toward federalism. Yet the first financial "reforms" were curiously naïve. Since the previous system of "divided heads"—by which certain revenues were shared—had caused disputes, and since it was supposed that federalism required a sharp division of fiscal powers, a system of separation of sources was arranged, with provincial contributions to make up an anticipated deficit in the central budget. The scheme worked badly. The provinces, rather than the central government, had deficits, and, when in 1930 a change was made, the system of "clean cut" was discarded.

Nowhere had federalism been debated more intensively in the past decade than in India. Granted that progress toward democratic government was inevitable, the corollary was that only under federalism could India remain united. With a population of 350,000,000, diverse in race, religion, economic interests, and with one-fifth of this population in the Indian states (as distinct from British India), a unitary government on a popular basis would be incredible. And yet the makers of a federal constitution for India have a unique problem. Their task is not to entice into union a group of semi-autonomous units, but to convert a unitary into a federal government. And the essence of modern federalism has been popular government, while India for centuries has been held together by autocracy, British or Mogul.

Throughout the book the author, as asides, refers to Australia, Canada, the United States, and sometimes he commits errors of fact or emphasis (pp. 350, 351, 354 n.). Possibly the experience of these

democratic countries is so alien as to be useless, but the suspicion lingers that English statesmen and writers in the twentieth century have not freed themselves from the concepts of unitary finance.

J. A. MAXWELL

Clark University

Principles of Corporate Finance. By MILO KIMBALL. New York: Longmans, Green & Co., 1939. Pp. ix+306. $1.00.

Principles of Corporate Finance is one volume in the series of "American Business Fundamentals." Like its companion volumes it is a brief treatment of essential principles and policies.

The author gives a terse explanation of the legal and economic concepts of the subject, being careful to avoid extending his treatment beyond the strict confines of finance. For this restraint he is to be congratulated since most authors in this field have not resisted the temptation to broaden the scope of the subject so as to include the various types of business enterprise, chapters on accounting, and diversions into the subject of investment.

As a treatment of corporate finance pretending only to lay out essential principles and practices, while at the same time clarifying the many concepts of the subject, it will find profitable use in supplying essential material for the student desiring an initial thorough survey of the subject. Even for the student in more pretentious courses in finance this volume will furnish invaluable material for a rapid survey of the field to be followed by more detailed study of special features.

The author has prepared a list of questions for each chapter which should aid the student materially in testing his own knowledge of the subject. Also a chapter by chapter list of references to the leading works in the field is included. Finally, the publishers should be commended for making this work available to the student at a low price.

JOHN E. KIRSHMAN

University of Nebraska

The Control of Competition in Canada. By LLOYD G. REYNOLDS. ("Harvard Studies in Monopoly and Competition.") Cambridge: Harvard University Press, 1940. Pp. xiv+324. $3.50.

Dr. Reynolds' book is the second volume in the "Harvard Studies in Monopoly and Competition." The study is an appraisal of the economic efficiency of industry and trade in Canada and of private and public regulative procedures, followed by specific recommenda-

tions for public policy. The analysis is centered and simplified by defining competition as rivalry in price, and monopoly as the control by a single seller of the entire supply of a product for which close substitutes are not available. But this classical conceptual horizon is widened by the use of the prevalent current refinements of monopoly analysis, without, however, displaying the more abstract, technical formulations that might frighten lay readers.

The introductory chapters contain neat characterizations of the important industries and trades derived from a thorough combing of published sources. The author concludes that the Canadian economy "operates much below maximum efficiency" (p. 271). Public policies toward competition are classified under three heads—"Preservation," "Limitation," and "Prevention"—followed by a well-balanced discussion of the legal and political limits of economic policy. Readers south of the Canadian line, unfamiliar with their northern neighbor's regulative procedures, would find these chapters particularly valuable because comparisons are made with the United States. On the whole, the conclusion is that Canadian public policy has not attempted to deal adequately and realistically with the problem of maximizing economic efficiency.

Dr. Reynolds' recommendations for public policy are derived from a "pluralistic approach"; i.e., policies must be adapted to the peculiar conditions in classes of industries. In those industries in which competition prevails or can be restored, he recommends the effective enforcement of the Combines Act. At the other extremity, where monopoly must be accepted, public operation is proposed because "commission control is either doomed to futility, or, if it is made effective, private management becomes redundant" (p. 283). In between lie many industries concerning which typically adequate knowledge is lacking; it is suggested that the first step here should be close investigation. For this purpose a "Division of Industrial Economics" is proposed. Additional recommendations are the "(1) removal of the support now given to combines and monopolies by the tariff and patent laws, (2) provision of more adequate information to consumers, (3) repeal of part of the existing price fixing legislation, (4) more careful regulation of new securities issues, and (5) amendment of the British North America Act" (p. 286).

The Control of Competition in Canada is a competent piece of work, showing a wide knowledge of industrial details and economic analysis and a common-sense appreciation of the practical limits of public

policy. The author does not claim that his results are definitive; they should, however, be an excellent base for further explorations.

EWALD T. GRETHER

University of California

Competitive Bidding for New Issues of Securities. By FRANKLIN T. MCCLINTOCK. New York: Harriman Ripley & Co., Inc., 1939. Pp. 73.

The S.E.C., the Federal Power Commission, and a few private interests have recently endeavored to extend the categories of corporation managements required to select underwriters of their new security flotations through competitive bidding rather than through private negotiations. Among the dozen drawbacks of this procedure alleged here are: (1) forcing prices to the public to unfairly high levels; (2) narrowing the distribution of new issues owing to elimination of widespread "selling groups" to save the cost of their commissions; (3) demolishing valuable relationships of underwriters with steady customers; and (4) accomplishing no useful purpose.

Mr. McClintock seems inclined to labor his objections, some of which appear readily amendable, and to assert conclusions before they are demonstrated. His attempt, too, to discredit the competitive bidding experience of New England utility companies, railroads (for equipment trust securities only), and state and local governments does not seem very successful. The possible occasion, however rare, for some regulatory intervention between underwriters and too friendly corporate managements is not discussed.

Nevertheless, except for the January, 1940, hearings on underwriting before the T.N.E.C., this brochure is probably the fullest treatment of the subject now available. It can be recommended further for some clearly expressed general information about the investment banking business.

GEORGE A. EDDY

Newtonville, Massachusetts

Price Control in Fascist Italy. By HENRY S. MILLER. New York: Columbia University Press, 1938. Pp. 146. $2.00.

This book was written mostly during the author's stay in Italy from June, 1937, to April, 1938. The wish to explore all available sources, to contact everyone actually engaged in Italian price-fixing policies,

appears to have been the main preoccupation of the author, and since, in most cases, he has been successful in gathering valuable information, he deserves full credit. In fact, Dr. Miller did not limit himself to outlining laws and regulations affecting the trend of Italian prices, but he tried, in addition, to present to the reader the interpretations offered by a number of Italian students or officials, no matter how obscure in the field of economics or in the ranks of the administration. The result of this laborious work of research is a first-hand picture, rich in its particulars, but rather indefinite in its contours. The reader, who knows that fascism has worked out a new scheme of economic organization for the Italian nation, that price control is one of the most elementary devices of any regulated economy, expects to be told how different price control in a corporative economy is from price control in other systems more familiar to the American public. The student, furthermore, who is fully aware of the Italian economic situation, wants to have explained why the government control of prices passed from a method of occasional regulations in emergency cases to a more organized control and why, in spite of the pressure imposed by political authorities, the trend of prices was mostly upward—even in those industries where the concentration of plants and standardization of production could have helped in the reduction of costs and, therefore, the lowering of prices themselves. The answers to those questions, whose roots are to be sought in the existing discrepancy between theory and practice of corporativism, as well as the theoretical implications of fascist price policies, are only casually given in Dr. Miller's book. For that reason this otherwise valuable piece of research ought to be considered more as raw material for the study of the economic involution of fascism than as a treatise complete in itself on price control in fascist Italy.

FAUSTO R. PITIGLIANI

New York City

The Consumer and the Economic Order. By WARREN C. WAITE and RALPH CASSADY, JR. New York: McGraw-Hill Book Co., Inc., 1939. Pp. x+389. $3.50.

Outstanding among the recent publications in the consumer education field is Waite and Cassady's *The Consumer and the Economic Order*. The authors in developing their book considered most of those topics found in a regular economics text from the point of view of the

consumer and his reactions. They thus vitalize the subject for their readers, because these readers become the center of the subject matter.

This book is an effort to show "the broad character of consumer problems." By broad, Waite and Cassady mean "the implications of actions by specific groups on the economic order and the ultimate results of various types of government action." In other words, they include not merely the restricted area of the consumer and "buymanship" but the consumer's wants, his needs, and their effect on the order. "Consumption," they write, "is a mode of life itself." As such, its problems of behavior and motives might well come within the scope of psychology instead of economics. However, when those resources satisfying human wants involve considerations of price, they are properly in the field of economics. Since we live in an economy organized around price, this makes vital and logical the study of consumption economics.

Primarily, the text concerns political (in contrast with household) economy affecting consumption. The status of the consumer in the existing order, the problem of consumer choices and their economic results, and the relation of human welfare to wealth are its three divisions.

Beginning with consumer income and price behavior, the authors consider the cost of living and its effect on real income. These chapters which explain simply and clearly some of those economic truths difficult for students to grasp are three of the fine ones in the book. In disagreeing with the age-old panacea of new laws to cure all ills (this time, laws for further consumer protection), they say that "consumer education is probably just as essential as protective legislation." Consumer protection cannot be completely effected without training in an intelligent approach to marketing problems.

There is a good chapter on "Consumers' Cooperation" and another on "Consumers' Purchasing Habits." A later chapter on "The Consumer and National Policy" is thought-provoking and leads to the final conclusion that the solution to America's problem of consumption must come from a larger volume of production. Far from believing that we live in an economy of abundance where the important problem is one of distributing what we produce, Waite and Cassady feel positive that much larger production will be necessary to achieve the greatest welfare of society as a whole.

This book is a solid contribution to the growing literature about the consumer and his problems; and the clearness of its presentation and

the thoroughness of its treatment of material make it a valuable text for students of consumption.

FRANCES LA BELLE HALL

Institute for Consumer Education
Stephens College

A. T. & T.: The Story of Industrial Conquest. By N. R. DANIELIAN. New York: Vanguard Press, 1939. Pp. 460. $3.75.

The author served as financial and utility expert with the Federal Communications Commission in its investigation of the telephone industry. Most of the descriptive material used in this work was taken from the mass of material collected in the course of this investigation and which "comprises over sixty volumes of transcript, over two thousand exhibits and more than seventy volumes of staff reports, ranging from fifty to more than five hundred pages of typed material."

The author has in mind the study of a subject much broader than the American Telephone and Telegraph Company. It is a study of American business. More particularly, the reprehensible practices of American business. Thus all the emphasis is upon the practices which reflect discredit rather than credit upon corporate managers.

The A.T. and T. was chosen for the case study primarily because the material was at hand, of course, but also because it suited the author's purpose since in the public mind it is regarded as one of the better-managed companies and yet falls far short of his ideal.

The virtues of the company are covered in less than a paragraph—"the most virtuous and service-conscious business in the country. There are no scarlet patches reflecting on its financial chastity—no financial double-dealing by officers, no extortion by insiders, no juggling of markets for the benefit of a favored few."

On the other hand, the practices calling for disapproval are discussed by chapters, not dismissed by phrases. The stock is not as widely distributed as the company's published figures indicate. Stockholders do not really choose the directors. The management rather perpetuates itself since the present dynasty was established by Morgan. The management has, in fact, served the stockholders well, but still, it is contended, the setup is fraught with danger since the management might just as well have decided not to do so.

The responsibilities of trusteeship which the management has assumed toward the stockholders have not been assumed toward em-

ployees and customers in equal degree. Since 1929 the number of employees has been greatly reduced, thus adding to the number of the nation's unemployed. This has been due in part to machine displacement and in part to the pressure to reduce expenses during the depression so that the dividend rate might be maintained.

The customers have suffered because of the reluctance on the part of the management to reduce rates which incidentally might very well have stimulated the demand for service and, also, through reluctance to introduce improved equipment such as the French phone.

The author devotes two chapters to a discussion of those Bell activities which might be variously described as public relations policies, good-will advertising, or propaganda. He chooses the latter designation.

The book contains an amount of interesting Bell System history and is well written in spite of much repetition of the author's ideas. However, the reviewer felt, at many points throughout the book, that the material was not being interpreted with a proper degree of objectivity; certainly not in the matter of emphasis.

J. WARREN STEHMAN

University of Minnesota

Economic Principles in Practice. By BRUCE WINTON KNIGHT. New York: Farrar & Rinehart, Inc., 1939. Pp. xvii+606. $3.25.

"In the present work," says Professor B. W. Knight, "I have tried hard to interest the beginner in the elements of economics." That he has tried hard there is no doubt. His book glitters with anecdote and epigram and has a chuckle in every chapter. It is up to the minute, the minute, that is, of 1939, which after all is only yesterday. It deals with most practical problems of economic importance. And, moreover, it breathes a spirit of liberal idealism which can hardly fail to have a desirable influence upon the hardened sons of economic royalists for whom it is no doubt intended.

What is more, Professor Knight has some important things to say on a great many subjects. His discussion of the regulation of prices is a real contribution to the arrangement of the subject, particularly his parallel treatment of the regulation of monopoly and of "surplus" industries such as agriculture. His remarks on "isms" are timely and well chosen and deserve a wider and more mature audience. His discussion of economic inequality is valuable if only for its daring. He

grasps more economic nettles than the fingers can count and sets forth a program of regulation, redistribution, and taxation with which to reform our major economic ills. There is nothing of the cautious and inconclusive weighing of evidence about Professor Knight. He has a lively point of view of his own, and the student will not receive the impression usual in economic texts—that economics exists to ask questions rather than to give answers. All the answers are here, whether they are right or not.

With all its virtues, the teacher who is looking for a careful and systematic exposition of the tools of economic analysis will not find them in this book. Supply and demand curves there are, it is true, treated in rather cavalier fashion. Of cost curves there is scarcely more than a mention. The theory of monopoly is treated on the assumption of straight-line demand and cost curves, a most unrealistic procedure which obscures many important theorems on monopoly and which is likely to mislead the student. There is no clear exposition of the relations of cost and supply curves or of productivity and demand curves. Indeed, the whole book seems to be designed for those allergic to any form of strict quantitative thinking. The student who comes through it will have his sensibilities awakened and will acquire many interesting and valuable opinions. But he will not obtain a clear picture of the implacable quantitative relationships of economic life.

Many colleges will find this book suitable for their requirements, particularly those where the aim of the economics course is to instil a liberal frame of mind rather than to instruct the student in a rigorous discipline of economic logic. Probably, however, it will prove most valuable as a supplement to those texts which give the grammar of economics rather than its conversation.

K. E. BOULDING

Colgate University

Federal, State, and Local Administrative Relationships in Agriculture, Vols. I and II. By CARLETON R. BALL. Berkeley: University of California Press, 1938. Vol. I: Pp. x+461; Vol. II: Pp. xi+677. $10.00 for both volumes.

This study is one of a series of "descriptive rather than critical" analyses of the interrelationships of federal, state, and local governments undertaken by the Bureau of Public Administration of the University of California. The two volumes under review, by a federal civil

servant with long experience in the Department of Agriculture, constitute an encyclopedic survey of co-operation between federal, state, and local agricultural agencies and between different administrative units at each of these levels of government. "Co-operation" is defined as: "Working together. It is used . . . . for every degree and kind of such mutual operations, from jointly planned and executed long-period research projects to minor collaboration on some special phase of a project, such as chemical analyses of the products of crop or livestock investigation." The methodology of the study apparently involved an examination of the publications of state and federal agricultural agencies in quest of acknowledgments of co-operation and other evidences of co-operative activity.

The data are presented in nine chapters, each "complete and self-contained" and likely to be used "chiefly by a different constituency." The first chapter deals with "Principles and Practices of Co-operation." The great mass of the material is arranged in chapters on each of the subject-matter fields: climate, soils, agricultural chemistry, animal industry, plant industries, agricultural education, agricultural engineering, agricultural economics. Each chapter consists of an account of instances of co-operation built on a framework of paragraphs succinctly describing the development and range of functions of each administrative agency concerned.

The material on agricultural economics, presumably of most interest to readers of this *Journal*, is classified under the following heads: "Crop and Livestock Estimates," "Farm Management and Costs," "Marketing Agricultural Products," "Land Economics," "Agricultural Finance," "Rural Sociology." Under each of these subdivisions there is, in addition to the description of the agencies concerned, a narrative catalogue of instances of co-operation:

> The Bureau of the Census obtains the coöperation of the United States Department of Agriculture in the preparation of the agricultural schedules. . . . . The Division of Crop and Livestock Estimates obtains the coöperation of the Post Office Department in permitting its rural mail carriers to distribute schedules. . . . . In 1925, the United States Tariff Commission and the Vermont Agricultural Experiment Station made a coöperative study of the economics of the farm manufacture of maple syrup and sugar in that state. . . . . In the Southern States, there was extensive coöperation with the Virginia Station. . . . . As early as 1920, the Federal Bureau of Markets coöperated with the California State Department of Agriculture in planning the details of a shipping-point inspection service. . . . . A study of cantaloupe production in Michigan, published by the State Station in 1930,

acknowledged data from the Chicago office of the Federal Market News Service and the use of the high school chemistry laboratory from the Benton Harbor school authorities.

What does it all add up to, if anything? The sheer bulk gives a notion of the degree to which the governmental agencies concerned are interrelated. The weight of two heavy volumes furnishes an index of the breadth and variety of governmental activities concerning agriculture in so far as they involve co-operation. It might be expected, from the title and the sponsorship, that the work would constitute a contribution toward the understanding of the vexing administrative problems involved in co-operative federal-state activities. Its primary utility, however, will probably be: (1) to younger students seeking a survey of the agencies and their activities in each of the fields covered; (2) to research and administrative workers employed in the agricultural agencies, as a reference work; (3) to students of public administration, as a source of clues to administrative situations worthy of more critical examination.

V. O. KEY, JR.

Johns Hopkins University

Racial Origins and Nativity of the Canadian People. By W. BURTON HURD. ("Census Monograph," No. 4.) Ottawa: Dominion Bureau of Statistics, 1937. Pp. xvii+292. $0.35.

Professor Hurd has analyzed the data of the 1931 Canadian census with a view to measuring precisely the process of assimilation. Such an attempt seems more feasible for Canada than for the United States because the Canadian census attempts to keep a record of racial origins. However, these data have their limitations. The author traces the changing proportions of various peoples for Canada as a whole and for such subdivisions as the provinces and the rural-urban dichotomy. The adjustments of these peoples to the Canadian scene are discussed under the topics "Segregation," "Naturalization," "Language," "Illiteracy," "Crime," "Occupational Distribution," "Fertility," and "Certain Physical and Mental Pathologies."

Among the most interesting features of this volume are the indices designed to measure the segregation of immigrant and racial origin groups. The time of settlement and the opportunities for spread of population at time of settlement do not receive attention. This reduces the usefulness of this measuring device. At best such devices are only rough indices of the processes of social adjustment. They do

not take account of the process of assimilation which goes on within segregated groups steadily and apparently causing less personal disorganization than when immigrants are widely dispersed among those diverging from them in culture. Furthermore, Professor Hurd's analysis does not take into account the fact that urban segregation in its nature and in its social effects differs widely from rural segregation.

Naturalization as an index to the character or extent of assimilation has a more limited usefulness than the author implies. It may mean little more than a means to land title, relief, or some other utility. For instance, Americans and Canadians, long familiar to common ways of life that enable them to live in either country with cultural ease, have been very tardy in taking out naturalization papers.

The clearing-out of the way at the outset of age, time, and other factors making for differences in intermarriage, etc., would have brought more sharply to attention the central social factors involved. While details in the establishment of indices may be criticized and many of the author's conclusions questioned, he has written a very readable book. Every student of Canada's population and social and economic life will continue to be greatly indebted to this pioneering effort of Professor Hurd.

C. A. DAWSON

McGill University

Democracy versus Socialism. By MAX HIRSCH. 3d ed. New York: Henry George School of Social Science, 1939. Pp. xxx+468. $2.00.

This book is a reprint, with an editor's preface and an appended brief life of the author, of a book first published in 1901. In a general way, it might be described as presenting the contrast between the Marxian philosophy and that of Henry George, the author being a protagonist of the latter. But such a statement would be far from giving a fair and accurate picture of the author's own critical contributions and the extent of his scholarship.

Although, in his critique of socialism, Hirsch devotes large attention to Marx, there are numerous other references, to Kirkup, Wallas, the Fabian essays, Schaeffle, the Webbs, Hobson, *et al.* And that he does not by any means follow Henry George in every respect is indicated as soon as he takes up the theory of interest on capital. Hirsch rejects the view of George that interest is due mainly to the growth of animals and plants and that it would not exist if all capital were in the form of carpenters' planes and other mechanical tools and buildings, which

do not "increase." Instead, he accepts Böhm-Bawerk's explanation of interest on capital and uses it as a basis for criticism of the socialist attack on interest as a "surplus value" or unearned income. With Böhm-Bawerk, he puts emphasis on the idea that "time elapses; what was next year becomes this year; and on the great changing stage of life everything—man himself, his wants and wishes, and with them the standard by which he measures his goods—shifts one scene forward" ("Positive Theory of Capital," p. 302). In other words, the passage of time makes that for which the capitalist paid a smaller sum become worth a larger sum.

In the reviewer's opinion, the fallacy in the socialist's view is brought out much more clearly and effectively when it is shown, first, that capital can come into existence only through saving; second, that through this capital there is a net addition to the output of industry; and, third, that therefore the persons through whose saving any capital comes into existence can appropriate this added output (or its money equivalent) without reducing the incomes of—and so without "robbing"—others.

In Hirsch's view, the justification of interest on capital does not at all extend to monopoly gains or to the rent of land, and he considers it important that the tax on land values be gradually increased until all the rental value is appropriated. This, with a proper policy in regard to monopoly and maintaining the price system with its voluntary choice of lines of work to follow, whether to save or not and how much to save, is the "democracy" of Hirsch's title, while socialism, he believes, inevitably involves centralized control of industry and of the lives of individuals, tending toward dictatorship and essential slavery. There are admirers of Hirsch's book who, pointing to the contemporary scene in Russia, consider it prophetic.

This, at least, would seem to be true: that a social philosophy which denies the justification or utility of private income from capital and envisages state ownership of all the means of production as a necessary means of preventing such income must rely on the state to provide for increase or maintenance of capital, and must rely on it, therefore, to compel saving and to determine what kinds of capital are to be constructed. Does such an extension of compulsion by government and of government functions tend in the direction of a general acceptance of the idea of compulsion and of political dictatorship?

HARRY GUNNISON BROWN

University of Missouri

Transportation in the United States. By T. W. Van Metre. Chicago: Foundation Press, Inc., 1939. Pp. viii+403. $3.75.

This book is intended for use as a textbook in general transportation courses in economics and in business. The author has tried to emphasize the practical aspects of the transportation business without going into too much detail. As to the theory of rates, he confesses that his interest has been more in the effect of rate theories on the actual rate structure than the "finer shades of abstract reasoning based upon assumptions derived from wholly imaginary situations." He has endeavored to present, impartially, controversial questions but has avowedly spoken his own mind on these subjects.

The book gives an unusually clear picture of American railroad transportation with occasional scant reference to other forms of transportation thrown in. Its clarity is exceptional in its field. The book would seem to be fitted for use as a basic text in a transportation course if the instructor gives considerable collateral reading assignments which take the student more deeply into the various subjects touched upon or if used as the sole text on transportation in courses which deal with more than that subject. It is best fitted for courses where the prime purpose is to impart knowledge, but it is doubtful if it will quite satisfy in courses where the prime purpose is to develop efficient and effective thinking.

The text is divided into four parts: "The History of American Transportation," "The Business of Transportation," "Shippers and Carriers," and "Regulation of the Transportation Business." The style is interesting and there is a great deal of good sense in spite of frequent dogmatic statements usually aimed at the sins and iniquities of railroad management.

Among recent transportation books it fits in somewhere between Daggett and Locklin and Miller on the one hand and the Wharton School texts on the other. It is almost a condensed text of the Wharton School transportation type. It is devoid of reference footnotes. The author has consciously avoided the breadth, the careful presentation of both sides, and the theoretical flavor of such excellent recent works as those by Daggett and Locklin and Miller, as well as the wealth of detail of books such as that by Johnson, Huebner, and Wilson. It apparently aims to supply an intermediate market.

In the concluding chapter, "The Transportation Problem," the treatment is more rounded than in the body of the work, and this chap-

ter is an interesting essay on the present problem. Professor Van Metre feels that there should be unified impartial regulation of transportation agencies, that the government should withdraw from the transportation business and should cease to subsidize any forms, and that the railroads should have greater freedom to abandon unprofitable operations. He also feels that co-operation between railroads on any large scale can only come through enforcement by the government.

The author, as professor of transportation at Columbia, is one of the "elder statesmen" in the field of transportation, and it may well be fitting that he should exhort (if not berate) railway management and the government. For younger men in the field, however, it would seem more desirable to co-operate with management and government in attempts to solve problems, the answers to which are probably more complicated than the author of this book believes.

GEORGE P. BAKER

Harvard University

Principles of Water Transportation. By LESLIE A. BRYAN. New York: Ronald Press Co., 1939. Pp. xv+429. $4.00.

Mr. Bryan has written a short, clear description of the shipping industry. His volume is about the same size as Berglund's book, published in 1931; and somewhat more brief than the volumes published by Zimmerman in 1922 and by Johnson, Huebner, and Henry in 1935. The discussion is divided into six parts: (1) "The Carrier and Its Stowage," (2) "The Water Terminal," (3) "Water Routes," (4) "Organization, Services, and Rates," (5) "Shipping Documents,"—including two chapters on marine insurance—and (6) "Aid and Regulation." More space is given to terminals and operation than in the other books mentioned, but this is not altogether a merit, because the discussion of terminals becomes involved with the peculiarities of physical layouts, and economic problems are rapidly passed over. Descriptions are clear, though brief, throughout, and the material is carefully arranged. Lists of discussion questions at the ends of chapters suggest topics for discussion which are not always fully or at all considered in the text, and these may encourage students to consult outside sources. Comparatively few of these questions, however, relate to contentious problems in which a choice between alternatives must be made. The book includes reference to shipping legislation as late as 1938, and it

summarizes recommendations of the Federal Coordinator which have not yet been embodied in law.

College teachers find it convenient to have a new summary statement of the shipping situation every few years, but it is a pity that we cannot get something better. There are two difficulties in the way of providing a real treatise on shipping for the use of college classes. The first is that the enrolment in courses devoted to the subject of water transportation is so small throughout the country that an adequate treatise is very likely to be published at a loss. The other difficulty is that the market is divided. Some students who are interested in ocean carriage desire a practical book which will train them for a shipping job; while others study the subject as they would any other topic in economics, in order to understand an institution which appears to play an important part in economic life. Doubtless, any book upon ocean transport must contain a good deal of descriptive material; but conditions being as they are, it seems to the reviewer that the way to overcome the difficulty which exists is to write a real book on the economics of shipping that will appeal to the second of the groups mentioned, not to continue with the publication of manuals for the use of the first. This is because (1) the second group is potentially numerous enough to make a good book pay, as the first group is not; and (2) a study of shipping with some breadth and depth would be fun to write and interesting to read. Mr. Bryan's present book is usable, but it is not at all the kind of thing which colleges need, if the reviewer is correct.

STUART DAGGETT

University of California

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